THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

VOL. XI. No. 258—14th YEAR.] LONDON, SEPTEMBER 9, 1862. [Subscription per Ann. { 15s. in Advance / 18s Credit.] Price 8d. Unstamped.

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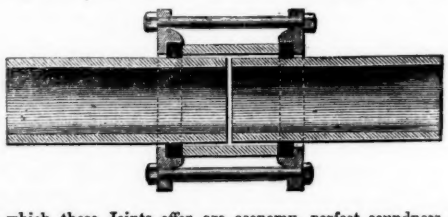

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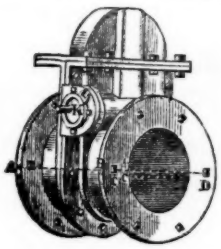

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TO CORRESPONDENTS.

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NOTICES.

The subscription is 15s. per annum, if paid in advance during the month of January, or 18s. credit, in two sums of 9s. each, in July and January of each year. Post-Office orders must be made payable at the Charing-Cross Money-Order Office, to William H. Bennett, No. 42, Parliament Street, Westminster.

The next number will be published on Tuesday, September 23, and the subsequent numbers on each successive alternate Tuesday.

Stamped copies, when forwarded by post, must be folded so as to expose the stamp; they are otherwise liable to the full postage charge for letters.

This JOURNAL has been duly registered at the General Post Office for transmission abroad.

All Communications to be addressed to the Editor, No. 42, Parliament Street, Westminster; and orders for Advertisements to the Publisher, Mr. W. B. King, No. 11, Bolt Court, Fleet Street.

THE JOURNAL OF GAS LIGHTING,
WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, SEPTEMBER 9, 1862.

Notes upon Passing Events.

A COMPARISON of the naval power of France and England has formed the subject of a series of essays by M. Xavier Raymond, in recent numbers of the *Revue des Deux Mondes*. M. Raymond is perfectly satisfied that France has succeeded in building better iron-cased ships, and producing more effective artillery than England. He believes that the administrative department of the French Navy is as nearly perfect as may be. He considers our *Warrior* ships and our Armstrong guns comparative failures; and, for the management of our Admiralty, he expresses his unmitigated contempt, not without giving his reasons. In his last paper he sums up his general conclusions in the following manner. He says—"The brilliant success that we (the French) have obtained in improving our naval power since 1815, does not give a true idea of the strength that we could develop in case of actual need, especially as we have never, even in 1854 and 1855, been engaged in real maritime war. But this fact must also be remembered, in thinking of England, who for half a century has had no opportunity of showing what she could do on a great emergency. The insignificant results obtained by the Admiralty, in return for enormous expenditure, only show a defect peculiar to the British Government, but give no idea of the latent strength of the British people. It would be a very great mistake to rest a comparison of the naval strength of the two countries on the comparative productions of the two Governments. Maritime superiority depends on three elements of strength—money, manufacturing power, and sailors. These are essential, and the want of any one cripples the utility of the rest. History teaches us that, if in military operations great results have been sometimes obtained by sheer audacity, in maritime war destruction has always fallen on those who have attempted great enterprises with insufficient means. It is true that at sea great things may be done by judiciously employing the peculiar strength which a nation may happen to possess. This is shown in the history of the war between the United States and England in 1812. But total ruin always follows attempts to seem a greater naval power than you are. The fate of the Navy of Louis XIV.—of Napoleon's eighty line-of-battleships—of the overgrown armament of Charles IV. of Spain—and of the Russian fleet, created at so much cost, which disappeared without firing a shot in 1854–6—combine to prove the truth of this axiom." That "money is the backbone of war," is a proverb, at least as true as respects naval as land forces. But, at sea, the want of money cannot be supplied by the courage and enthusiasm of the multitude. The increased expense of the machinery and munitions of war, and the consequent cost of the most simple operations, have widened the distance between the maritime powers of different nations. Thus, at the commencement of the present century, in the time of Nelson, the English estimated the cost of a fleet by the number of guns, and put down each gun at £1000. With wooden war-steamers, this sum was increased to £5000 or £6000 per gun; and, with an armour-plated frigate, like the *Warrior*, it would rise to £10,000 per gun. In many kingdoms, the whole sum devoted to their Navy is less than the cost of a single armour-plated frigate. A proportionate expense must be allowed for maintenance and repairs. Then, again, even in fine weather, every league under steam of such a ship as the *Warrior* costs from 30s. to 35s. Thus, the financial question alone will, in the epoch of iron-plated ships, throw into the shade the pretensions of minor States, like Denmark, which formerly played an honourable if secondary part in maritime warfare." Two or three iron-plated ships would be enough now to do the work of the great fleet under Nelson and Hyde Parker. Yet, a minor maritime power can no more venture to devote all their resources to one great iron frigate, than a small farmer can afford to sink all the capital now employed in horses, and ploughs, and harrows, in the purchase of one steam-cultivator. Cutters and schooners, and wooden frigates for distant voyages, would still be required.

Another great change has taken place. Formerly, vessels of war were almost exclusively built in Government arsenals; and a merchant-vessel of more than 500 tons was considered an extraordinary sight. Nelson's line-of-battle ship, the *Victory*, at Trafalgar, was scarcely over 2000 tons. But, of late years, both in England and America, merchant-ships, in great numbers, have been built of tonnage exceeding that of line-of-battle ships. Since 1831, when the French Government purchased an establishment (*Indret*), in order to manufacture steam-engines of 160 horse-power, a size which no factory in France could then turn out, three or four great factories have been founded by private means capable of building engines of 1000 horse-power, or more, if necessary. In England, the Admiralty, which purchases at least 18,000 horse-power every year, has only repairing-shops, and does not manufacture any of the steam-engines employed in the fleet. It must, therefore, not be forgotten that the private workshops able to manufacture these huge steam-engines are also able, on an emergency, to produce everything in metal that the Navy might require. It would be only child's-play for great factories to found cannon, or forge anchors. The tendency to use iron instead of wood in the construction of war-ships, daily draws closer the connexion between the factories producing industrial,

and those making warlike implements, and machinery. During the Crimean war, agricultural-implement makers were not the least successful in casting cannon, toward the mixture of whose metals even Quakers gave hints, after declining any share of the profits of the contract. M. Raymond shows, that without sailors there can be no Navy, and takes for his example Russia, where the cultivation of a fleet has been the care of the sovereign since the time of Peter the Great—Russia, which had forty-two ships of the line afloat in 1854, and yet was not, and is not, a maritime nation for want of a breed of sailors. M. Raymond does not believe that the adoption of steam navigation, has reduced the naval preponderance of England: on the contrary, he thinks that it has increased the maritime power of England in so signal a manner as to be beyond dispute.

He devotes somes pages of his amusing essays to sketching the composition and comicalities of our Admiralty. A First Lord, who knows nothing of naval affairs; two lay lords, taken out of the miscellaneous herds of M.P.'s; and four naval lords, who are seamen without, unless by accident, any knowledge of the arts, sciences, and practices essential for naval construction, excite his astonishment and contemptuous pity. He shows that at a time when the construction of our ships, docks, and engines of war, requires the highest degree of practical science, our naval Government is conducted by men who are at best totally ignorant of everything but seamanship; and, as a rule, are excessively jealous of placing any power in the hands of the only class of persons who could understand or introduce improvements. To an intelligent Frenchman, it sounds like a farce that an old admiral of the præ-steam age, should hold a post in which he is supposed to supervise and control the construction of the iron steam-driven Navy. It is something like putting the Queen's state coachman to train a horse for the Derby, because he could drive six cream colours in hand. Formerly, there was a special corps of shipwrights, which has, however, been completely suppressed by the influence of the naval officers. "In order to destroy every trace of this institution, even the library, which formerly existed at Deptford, has been systematically dispersed amongst the various ports." The result is, that, although no money is spared in shipbuilding, the shipbuilders are placed in a position of inferiority and dependence, to which superior men of the scientific ability and education essential at the present day will not submit.

No doubt, in this iron age, the shipwrights establishment would, under any circumstances, require remodelling, and a school of naval architecture could only prepare pupils for the real instruction they must receive in great mechanical factories. Still, the absurdity remains that the designs and the execution of our fleets are entirely under the control of a board which knows nothing, and a Comptroller of the Navy who only knows what he has learned in his old age of steam-power and iron construction. The result is pithily summed up by M. Raymond: "It would be difficult," he observes, "to quote any single step of progress in naval construction or warfare due, during the last half century, to the British Admiralty. Always deficient in foresight, it does not even notice what is taking place on the other side of the Channel. It was not until France had, for seven years, given up building sailing-ships, that the House of Commons, in 1851, compelled the Admiralty to take the same course. When the French Government had, for four years, ceased to build wooden steamships—the Admiralty having, rather tardily, discovered that France had nearly as many as England—set about what was called *the reconstruction of the Navy*. At that very time, the iron-cased frigate, *La Gloire*, had been for a whole year one of the sights of the shipyards of Toulon. . . . Nevertheless," pursues M. Raymond, "the truth is that, in spite of the follies and the shortcomings of the British Admiralty, England is still the greatest maritime power in the world. It is absurd to estimate the extent of this power by the doings of the Admiralty, whose expenditure is a mere trifle, and represents only an outpost of the inexhaustible resources on which England could draw in case of a real maritime contest. . . . In France, the means at the disposal of the Minister of the Marine represent by far the largest part of our available resources as a maritime power. In England, not the Admiralty only, but the whole nation has a leading share in her naval power. . . . As regards money, England has the most flourishing and best-managed finances in the world. We are no longer amused by stories of her approaching bankruptcy, crushed under a load of debt." Facts demonstrate "the fallacy of this notion, once so popular on the Continent. Facts prove that, of all countries, England bears her public debt with the greatest ease. We have seen her Three per Cents. at and above par, and they maintain an average between 90 and 92. . . . Our (French) Three per Cents. have never risen above 86; during many years of parliamentary government, they floated at 80; at present, they range between 68 and 70. . . . England's manufacturing powers are incontestable; and her special capabilities, in regard to naval warfare, are best illustrated by incidents of the Crimean War." M. Raymond then proceeds to relate how Mr. Laird received an order for a gunboat on the 25th of October, which, on the 11th of November following, sailed into Portsmouth complete, except her engines; and, also, that Mr. Laird's factory, at the time the war closed, was in such a condition of activity, that he was delivering gunboats at the rate of one a day. Thus, by similar contracts with other builders, the Government had, when the Treaty of Paris was signed, increased the Navy by 200 gunboats and 100 floating-batteries. We can add, for the information of the writer, that there are, at the present time, sixty private builders of iron steamboats, each capable of turning out from 3 to 30 ships in a year. Therefore, to put down the annual building force of private yards at 200 ships of a 1000 tons each, would be under the mark.

The results in engines were nor less remarkable than in ships. "For instance, one firm, Messrs. Penn and Son, in December, 1853, entered into a contract with the Government to supply, by the 1st of April, 1856, eighty engines, each of sixty-horse power; and this contract was so fully carried out that, at the date named, the total number of engines had not only been delivered, but fixed aboard the vessels for which they were required. . . . The Admiralty is only a department in England, for it had nothing to do with the productive power which in two years increased the Navy from 212 to 590 vessels of war. . . . The manufacturing industry of England contains within its workshops untold treasures of defence and offence never to be counted until England, in a contest with some more powerful maritime adversary than Russia, is struggling not only for reputation, but for existence."

As regards the capability of manning a fleet, "figures not less eloquent display her power. Without counting the 80,000 men enrolled in the Navy, the commercial marine in deep-sea and coasting voyages employs 230,000 men; and, if there be also included the classes registered under our French maritime inscription—viz., canal boatmen, fishermen, river boatmen, and the artisans in private and public shipyards—the total population would not fall short of from 700,000 to 800,000 men We must not, therefore, let the blunders of the Admiralty lead us to believe that the genius of the sea has deserted England. . . . English builders and shipowners have succeeded in reducing voyages to India and China from 150 to 160 days to an average of 90 days, and this with ships which are not only the most numerous, but the finest in the world. . . . A friend of ours, an admiral," says M. Raymond, "who had recently returned from a visit to England, said the other day to a Parisian chatterer who was dwelling on the weakness of the English Admiralty, 'Pray, sir, don't bother me with the Admiralty. The Lords of the Admiralty are old women; in skill and enterprise two hundred years behind the smallest French shipbuilder. It is not there that you must seek for the key of England's naval power. In France, the Navy is a thing created by the Government; in England, it is a part of the nation. That makes an enormous difference, and we cannot be too jealous of such a power.' . . . The vast extent of their maritime commerce has enabled the English to divide their shipping into classes, each fit for a special object. Instead of a vessel used for every kind of trade in turn, there is the sailing or steam-collier, the timber-ship, the clipper, for bringing tea from China, and gold from Australia, a class of ships which, in swiftness, and in the skilfulness with which they are navigated, equal the sailing war-ships of any nation. At present, the China and India clippers are in part superseded by steam-ships, another of the glories and triumphs of England's maritime commerce. . . England did not invent the steam-engine* (?); she was not the first to apply it as a means of propulsion; but it is only common

* Who did?.—Ed. J. G. L.

justice to admit that she has done more than all the other nations of the world together to perfect and generalize the employment of the steam-engine in every kind of vessel, from the small swift *Watermen* and *Citizens* that swarm on the Thames, steering with wonderful ease and safety amidst the numerous fleets with which that river is ever crowded, up to the gigantic *Great Eastern*. The zeal with which the nation at large, as distinguished from the shipbuilders, engine-manufacturers, and shipowners have supported every undertaking for extending steam-navigation proves how much the British people have their maritime superiority at heart. This was shown when the question arose of establishing steam-navigation with America; of experimenting on a large scale with the screw (which, by the bye, the Admiralty so long obstinately neglected); and, above all, when millions (of francs) were subscribed to build the *Great Eastern*: the majority of the subscribers, in the last instance, were intent rather in trying a great experiment than tempted by hopes of a dividend. Thus it is that the English are the originators of the lines of mail-steamers, which unite the most distant regions, and bring the communications of Europe and the Antipodes within a maximum of counted days, reducing the nine months voyage of our fathers to two. . . . While the British Admiralty has been barren, or only the producer of abortions, private enterprise has established companies which perform the postal service to four quarters of the globe, and employ more than 100,000 horse-power, in steam-ships which we should pronounce to be perfect, if the able men who direct; the skilful engineers who construct, and the experienced mariners who sail these marvels of steam-shipping, did not daily make some striking improvement. But, in our eyes, the maritime superiority which the English enjoy, in consequence of the flourishing state of their finances, the advanced condition of their manufacturing industry, the number and skill of their seamen, is enormously enhanced by the moral force which they wield as the freest and most united people in the world. Other nations have the benefits of central administration, legal and political uniformity. England has all the strength derived from a union of opinion, tastes, and feelings; a very different kind of vigour, and a very different foundation for confidence in the future, from that derived from paper constitutions." This may seem a hazardous assertion to those who, taking a superficial view, consider that they have said everything when they contemptuously sum up England as "an aristocratic Government." But they mean, by this phrase, something which did at one time exist in certain parts of Europe (and does, indeed, exist in certain parts of Germany at the present time), but has never been, and certainly is not now anything like the English Government. By aristocracy, they mean a series of privileged classes jealous of each other; the higher ever pressing hard upon the lower. Nothing can be more absurd as applied to England. The English know how to live without showing insolence to their inferiors, or feeling envy towards their superiors in rank. Every Englishman has a right to aspire to rise in social position, but they are not in the habit of making it a grievance that they are not peers nor baronets. Such whinings would be considered ridiculous, and be heard with contempt, because there is nothing in the laws, or the customs, or the manners of English society, to prevent a successful man from attaining and being freely admitted into the highest rank. The English is the only aristocracy that has always cordially, and even respectfully received those who have succeeded in acquiring a place in their rolls. This is so true of the English aristocracy and people, that there is no word in in their language to translate the idea which we express by the word *parvenu!* the idea is not English. The law of primogeniture, so offensive to us, has the effect in England of compelling younger sons to work if they would not fall back into the undistinguished crowd. The motto, "*help yourself!*" is thoroughly English, for it means "you can if you choose." There are political parties in England, but they are quite unlike what is known by the same name in other countries. On the continent, a political opposition is often composed of agglomerations of individuals, or, more dangerous still, of classes who hold entirely different principles of Government and social order from the existing Government. In England, there is nothing of the kind to be found; Whigs, Tories, and Radicals are all agreed on first principles, and only differ slightly on the mode of application. At this moment hunger is cruelly felt in the cotton districts, yet there has been no disorder; the people resign themselves with manly courage to an inevitable misfortune. We only hear of "*meetings*," at which all are permitted to attend and freely discuss the best means of assuaging this national calamity. Are there many countries where, with perfect liberty of action in speaking, writing, and assembling, an affliction so terrible would be patiently borne without the slightest disturbance of public tranquillity? In the midst of the cotton crisis, the Volunteer movement is steadily carried out. We may consider that this movement has originated in groundless fears of aggression. The Volunteers may never have an enemy to fight, but they have taught the world a great lesson. When we mark the uneasiness caused in France by associations so harmless as those of the Freemasons, or the Society of St. Vincent de Paul, it is impossible not to be struck with the social security and self-confidence of a nation where 170,000 men are allowed to organize themselves into an army, to assemble from time to time, with rifles and ball cartridges, in bodies of twenty to thirty thousand, without exciting the slightest anxiety on the part of the Government. "Thus England is superior in wealth and manufactures to any other nation, and has the advantage of numbers in her maritime population. These elements of power are strengthened by the liberty which enables every citizen *to do his best*. The resources which enabled England to triumph on the sea half a century ago remain with her. They have been increased and developed by peace, by internal prosperity, by political, social, and economical reforms. Even the changes which have been introduced into war-shipping and artillery have been to the advantage of England, because they require a large expenditure of money, steam-power, and more iron than ever. The British Admiralty is only a screen, behind which a whole nation of seamen, strengthened by liberty, daily grows more wealthy and more powerful!"

ON THE LEGAL POSITION AND PROSPECTS OF THE SO-CALLED NOXIOUS TRADES.

The fate of Cassandra was, after all, but a prototype of the fate of those who strive to oppose the fashions and the tendencies of their times, on account of the discrepancies between those fashions and the laws of common sense. Hard names and unbelief meet the advocates of truth; and the fashionable prophets have it all their own way amongst the unthinking crowd. So it has been with ourselves, in the matter of the regulation of the so-called unhealthy trades; and all our efforts to rouse the manufacturing interest to the dangerous tendency of modern legislation upon these questions, have thus far proved of little use. The manufacturers, for a time, have, it may be, bestirred themselves, and procured modifications of the more objectionable Bills lately introduced for the purpose of interfering with their pursuits; but, the immediate danger passed, they have subsided into inaction, and they have left the newly-created branches of the Civil Service at full liberty to create work for themselves, by claptrap appeals to the world at large on grounds supposed to be connected with public health. The natural consequence has ensued; and the "sensation" speeches and writings of the self-constituted teachers of Sanitary Science have so frightened the more impressionable portions of the public, that, unless the manufacturers look to it in time, they will again have to encounter as violent a crusade as they did in 1855, 1856, and 1857, when we first urged them to defend themselves. The most important indications of the temper and tendencies of the times are, perhaps, to be found in Lord Derby's attack upon the manufacturers near St. Helen's, and in the arguments of the Judges of the Court of Exchequer Chamber, in the case of *Bamford v. Turnley*,, inserted in the previous number of our Journal; to both of these we now propose to call the serious attention of our readers, more on account of their tendencies than of their immediate action.

Lord Derby, in the commencement of the session, drew the attention of the House of Lords to the state of things asserted to prevail in the neighbourhood of St. Helen's, in Lancashire, in consequence of the evolution of noxious vapours from the chimneys of the numerous alkali, and other chemical works, and from the copper refineries there collected. The tale then told of the injury to vegetation by these vapours, within a considerable radius, was startling, and it must be confessed that it was substantially true; but no one seems to have called attention to the fact that the extent of the mischief thus produced depended greatly on the concentration of these noxious

trades into one focus; and that it was precisely this concentration which created the value of the property round the particular town referred to. However, Lord Derby had touched a string which was sure to wake accords amongst the amiable sanitarians of the Upper House; and his influence was sufficient to ensure the nomination of the committee he asked for, "to inquire into the injury resulting from the noxious vapours evolved in certain manufacturing processes, and into the state of the law relating thereto." The committee only comprised one law lord, the others members being but slightly connected with the manufacturing interests. They proceeded to hear evidence, but their first resolution was the ordinary one in such cases, viz., to the effect that "no copies thereof be delivered, except to members of the committee, until further orders;" so that the manufacturing interests were compelled either to attend all the sittings, or to remain in ignorance of the charges brought against them by the selected witnesses examined before the committee; and upon the evidence thus given a report has been drawn up, which foreshadows changes in the sanitary legislation of the country, capable of being easily converted into means of oppression and ruin to the manufacturers.

The first impression produced by the report and evidence published by Lord Derby's committee is, upon our minds at least, that there is something repulsive in the facility with which a powerful nobleman can provoke legislative action in a matter connected with his own personal interests, whilst private individuals are left unheeded, when they complain under analogous circumstances. The wrongs of St. Helen's are at once attended to; those of Swansea have been the subject of discussion amongst the sufferers out of doors for years, in vain; and, indeed, the influence of the metal-workers in Parliament was sufficiently great in 1857 to enable them to secure special exemption for their operations from the provisions of the Local Government Act, for the regulation of the so-called noxious trades. Of course, this partial legislation does not affect the real merits of the case, and the facts it was really necessary to acertain were: firstly, whether the processes carried on by any particular class of manufactures are injurious to the health of the population, or of the vegetation of the surrounding district; and, secondly, if so, how could a remedy be applied in a speedy and economical manner? After making every allowance for the anxiety of the witnesses examined before Lord Derby's committee, "to make a case," and for the palpable exaggerations they have been betrayed into, there seems to be no reason to question the noxious influences of the vapours, and of the refuse of certain chemical manufactures. The discussion, therefore, practically narrows itself to the measures to be taken to abate, or, if needs be, to suppress such serious public nuisances, without inflicting unnecessary injury on the productive industry of the country, or the wanton sacrifice of private property.

At the present day, the only method of protecting the rights of private property from the effects of noxious trades are those cited in the report of the committee—viz., "1. By an action for damages, where individual injury is alleged; and 2, by an indictment, where the injury complained of is general and public." By some recent measures, such as the Towns Improvement Act, the Nuisances Removal Act, the Public Health Act, the Local Government Act, the Smoke Prevention Act, &c., more expeditious means of dealing with public nuisances are provided, and even an attempt has been made in one section of the Public Health Act to establish a preliminary inquiry before the establishment of certain trades in the districts where that Act has been adopted. Unfortunately our laws are made, explained, and administered by lawyers; and, practically, society discovers that it is always a costly, and rarely a satisfactory course for the interests of justice to appeal to the law courts. This is emphatically the case with respect to the nuisances arising, or supposed to arise, from an extensive manufacture; and the result of the actions brought against the alkali manufacturers of St. Helen's, or against the copper smelters of Swansea, has simply been to prove that it is often worth the while of men of business to incur the risk, or to pay the costs of those actions, provided only that by so doing they can continue to carry on their trade operations. It becomes, in fact, to them a mere question of money, whether the profits of the trade will cover the costs of the actions to which they are exposed: the prosecutors in the meanwhile being certainly exposed to annoyance, anxiety, and expense, by the measures they adopt to protect themselves. As to the assumed protection of private interests by the imperfect *à priori* regulations of the Public Health Act, it is found to be illusory in every respect, for no inquiry (of any value, at least) takes place before the establishment of a so-called noxious trade in the towns submitted to that measure; and, even if such valid inquiries did take place, the effect of them would only be to give the factories, which might subsequently be found to be nuisances, a legal and indefeasible existence. The committee are, therefore, perfectly justified in their assertion that no effectual remedy to existing evils of the nature under consideration exists, and that a great change in the law on these matters is required. Such change, however, must provide the manufacturer with protection against the caprices of sanitary enthusiasts, or of personal enemies, quite as much as it should provide the means of abating a proved public annoyance. Injudicious interferences with trade, indeed, are more fatal to the true interests of society than the local injuries caused by unregulated trade can ever be; the tendency of modern legislation, and the opinions of Lord Derby's Committee, unfortunately give reason to fear that the former course will be the one adopted in any future enactments for the remedy of existing laws.

The committee seem, indeed, after "supping their fill of horrors," in the evidence of the practical men selected for the purpose of proving the nature and extent of the injuries caused by alkali and copper-works, to have given themselves over to the inspirations of Mr. Tom Taylor, and to the suggestions of expectant inspectors of chemical factories. Mr. Taylor, who avows that he drew the Nuisances Removal Act, 18 and 19 Vict., c. 121, states that the provisions originally introduced into the Bill, for the purpose of ensuring parochial control over the enforcement of the powers it created, were repealed by a subsequent Act (23 and 24 Vict., c. 77), by which any inhabitant of any place should be entitled to set the powers of the Nuisances Removal Act in motion: and, after pointing out the difficulties attending the interpretation of some of the clauses of his own legislative production, he recommends that the provisions against smoke should be extended so as to include noxious vapours, whether arising from chemical factories, brick-making, coke-burning, artificial cement-making, varnish-works, &c. The Amendment Act, cited by Mr. Taylor, also transferred the powers originally given to local authorities, and Nuisance Removal Committes, by the Act 18 and 19 Vict., c. 121, from them to the board of guardians; because it was pretended that there was an indisposition on the part of the local authorities to proceed against persons of influence in their neighbourhood, and Mr. Taylor evidently desired that some general authority should be established, which should be able to inspect all the manufactories which would come under the proposed extended provisions of the Acts for the protection of the public health, and "to lay down some directions upon the subject, to which conformity should be compelled. . . You would want men like the mining and factory inspectors. There would have to be a general authority; you would want a superior class of inspectors, to lay down the conditions on which trades should be carried on; and then you might have local inspectors under them, who would see that their directions should be carried out." Drs. Hofmann and Frankland, notwithstanding their evident desire not to interfere with trade, seem also to have been of opinion that inspectors were required to enforce the measures which might be prescribed for the condensation of the noxious gases of chemical works; and Messrs. Garvey, Ansell, and P. H. Holland, as might have been expected from their previous histories, were very decided in their opinions as to the necessity of a powerful central administration, with full authority over these matters, and with a numerous staff to carry out its behests. The effect of this evidence eventually was, to induce the noble Members of the committee "to record their opinion that, for the effectual suppression of the nuisance—[they confined themselves, be it observed, simply to one form of nuisance]—it will be necessary that inspectors, properly qualified, should be appointed, who should, at all times, have free access to the works, with or without notice, so far as may be necessary for ascertaining that nuisance is effectually prevented, and who should be officially charged with enforcing the law;" and they also expressed their opinion, that the most respectable manufacturers would willingly co-operate with the Government in preparing and carrying out such a measure.

Now, on this subject, the opinions always advocated by this JOURNAL, have been that the real remedy to the evils complained of is to be found in the simplification, and the cheap-

ening, of the forms of trial before the ordinary tribunals which regulate parochial matters. Actions for damage, and indictments against nuisance trades, are precisely of the nature to be tried before the quarter sessions; and the class of jurymen to whom such causes are submitted is precisely the class most likely to be able to form correct opinions on their merits; whilst the power of appeal from the sessions to a higher court, on matters of law, affords a guarantee against any abuse of the principles of legislation. As to specific regulations, or general rules, to enforce the condensation, or consumption of noxious gases, they must always be susceptible of abuse, and occasionally of unnecessary interference with trade; because, firstly, there is no guarantee that the parties who draw up the regulations should know anything of the business they undertake to control; and, secondly, because the experience of the working of the Coal and Factory Inspection Acts, and of the Smoke Nuisance Act, has shown that the inspectors are by no means above unfair influences, nor are they usually able to appreciate the real necessities of the factories they visit. In fact, the whole of the measures lately introduced for the avowed purpose of extending the parental care of the State over those who are assumed to be unable to take care of themselves, is founded upon an imitation of the French system of administration; and the report of Mr. Waller Lewis on the French law of unhealthy trades, to which we called attention some years since, contains the germ of the measures that strangely vivacious body, the supposed late General Board of Health, still strives to enforce. Evidently the *clique* which now influences our rulers in their anxiety to regulate trade, and to protect society against the evils of the *laissez-faire* system on which England has hitherto so illogically thriven, are now striving to submit certain industries to preliminary investigations, and to stringent supervision; but, an appeal to the practical working of the systems adopted respectively in France and in England, would, we believe, convince even Lord Derby himself, that it is far safer and far better for the public interests, that whatever action may be taken by the State, or by local authorities in these matters, should be taken *à parte post*, instead of being *à parte ante*, as he seems now to desire. Every preliminary inquiry is a check to industry—a great discouragement to enterprise—and it is so found to be in France and on the continent generally. Every attempt to regulate, by rules laid down by the superior administration, the details of a factory, is known to be a check upon invention, and an encouragement to routine; and, so far as the prevention of noxious influences is concerned, practical experience has shown that an efficient responsibility on the part of the manufacturer to his neighbours, is far more efficacious than any *à priori* regulations, or any official inspection. If, however, it be necessary for carrying on Her Majesty's Government, that new places of inspectors be created, the manufacturing interests would gain by a frank and entire adoption of the French system; for the preliminary inquiry, before establishing a so-called unwholesome trade, would constitute a species of chartered immunity from subsequent proceedings; and the very extent of this interference with the freedom of trade would render it necessary for the Government to employ a staff of a much higher character than the inspectors who now so sadly disgrace the scientific reputation of the country.

It is strange that Administrative Reformers cannot see that the tendency of all these measures for inspecting trades is to increase the already continually-augmenting burthen of the Civil Service, and the habit of casting upon the State the discharge of duties which really are incumbent on individuals. The cost of the new inspectorships would, of course, fall upon the Consolidated Fund; so that, really, the nation at large would pay for the protection of the neighbours of a factory, who now have to protect themselves at their own expense. The true policy of the Government we hold to be to facilitate legal proceedings by the parties injured; and there seems, from the evidence given before Lord Derby's Committee, to be no real difficulty in so doing. The recommendations of the committee would but lead to a perpetuation, and an extension of some of the worst jobs of modern times; and, unless the manufacturing interests look to it at once, they will find themselves again saddled with "the old man of the sea" they hoped to have shaken off for ever, by their efforts on the occasion of presenting the Act 18 & 19 Vict., c. 121. That we are not exaggerating, or conjuring up an imaginary danger, must be evident to any one who follows the history of the Amendment Act of 1860; and the trading community would do well to reflect that the body which, by biding its time, and watching its opportunity, was able to reverse the policy of the Act of 1855, and to transfer the power of prosecuting nuisances from the parochial authorities to the board of guardians, may be able to revive the powers of the General Board of Health, even in an extended form, on some future occasion.

The decision of the Court of Exchequer Chamber, in the case of *Bamford v. Turnley*, seems to confirm our suspicion that, in the present temper of the Bench, and of the Legislature, it would be preferable for the manufacturing interests at once to adopt the principles of the French system of preliminary inquiries, in the case of certain trades. It seems that, in this particular instance, some land had been put up for sale at Norwood, by certain parties, with an intimation that there was gravel and brick-earth upon it; one party purchased a plot in 1857, burned bricks upon that plot, and erected a house, which he let to the plaintiff; the defendant, in 1858, purchased another plot of the same land, and also began to burn bricks, whereupon the plaintiff brought his action for damages. Chief Justice Cockburn directed the jury, "that if they should be of opinion that the spot was a convenient and proper spot, and the burning of the bricks, under the circumstances proved on trial, was a reasonable use by the defendant of his own land," he would be entitled to a verdict, even if the plaintiff were subjected to annoyance; upon this ruling, a verdict was given for the defendant, but leave was reserved to the plaintiff to move for a new trial. On application to the Court of Queen's Bench, however, the rule to show cause was refused, and an appeal was, thereupon, brought before the Court of Error, sitting in the Exchequer Chamber, where, as will be seen by the report, in our last number, the judgment of the Court of Queen's Bench was reversed. The effect of this decision practically is, that even a reasonable use of a man's own property may be a ground of action for damages, if that use should constitute a nuisance to a neighbour, previously established in the locality. This is a striking illustration of the power of the common law to enforce the application of the principle of "*sic utere tuo, ut alienum ne lædas*," and on that score it may be recommended to the notice of Lord Derby and of his committee; but it throws a fearful degree of uncertainty about all industrial operations in fresh localities. If, for instance, a coal-mine were discovered under a certain estate, it might be rendered of no value if some neighbouring proprietor should be able to prove that its working interfered with the comfortable occupation of his property, and he were unwilling to part with the latter. There must be some limit at which private interests should be made to yield to public benefit; and, though it is possible to set aside any such opposition to progress as we have supposed by means of a special Act of the Legislature, yet, cases will arise wherein it may be desirable, even as a matter of public policy, to cause private interests to give way to public improvements, or even to public convenience. At Norwood, bricks are sufficiently cheap, at present, to render the decision of the court a matter of little practical inconvenience to owners about to build; but it also practically confers a monopoly on the proprietors of the existing brickfields, and diminishes the value of property in that neighbourhood. The great question of the right of existing brickfields, however, to continue their operations was not touched by the case; and the public is still in uncertainty as to whether, or not, it be possible for a new comer to put down a trade (susceptible of being considered a nuisance), which had been previously established, but which might interfere with his comfortable enjoyment of his newly-acquired property. The argument of Justice Williams, indeed, leads to the conclusion that any common nuisance may be suppressed, however long it may have been established; yet, if people go to a nuisance, why should they be entitled to drive it elsewhere? The whole question of the so-called noxious trades is, in fact, at present in a sadly confused state; and the manufacturers themselves, it cannot be too often repeated, must take it seriously into consideration.

Circular to Gas Companies.

THE accounts from the Metropolitan Gas Companies, "showing the actual state and condition of each company as to capital, revenue, and dividends, for the year 1861," which were presented to Parliament pursuant to the 41st section of the Metropolis Gas Act, have been printed, and were issued on

the 6th inst. We purpose giving in our next number a tabulated abstract of the principal items of this important document; and, in the meantime, we select from it the following details, which will be read with much interest.

The total paid-up capital of the thirteen companies comprised in this parliamentary return, including the sums borrowed and capitalized profits, amounts to no less than £5,647,900. The total gas rental of the last year was £1,385,592. 7s. 8d., which was derived from the sale of common gas, cannel gas, and from public and contract lights, in the following proportions:—

Common gas	£1,075,477	17	8
Cannel gas	110,824	4	7
Public and contract lights .	199,290	5	5

The separate gas rentals of each company respectively are thus specified:—

Chartered (including lighting the public lamps) . . .	£214,103	3	8
*City of London	82,234	19	0
*Commercial	94,324	10	11
Equitable.	66,052	11	3
*Great Central	61,882	18	4
Imperial	356,929	17	8
Independent	59,202	10	0
London	127,682	19	9
*Phœnix	128,088	18	10
Ratcliff	27,776	12	1
South Metropolitan . . .	57,407	5	1
*Surrey Consumers . . .	46,410	6	4
Western	63,495	14	9

The five companies marked with asterisks provided their customers with meters without charge. The meter-rents received by the eight other companies amounted to £15,653. 15s. 7d.; and, if all the companies had charged for the meters provided by them according to their proportionate gas rentals, the aggregate charge on that account would have been increased to £22,300. It appears that the cost of meters and repairs amounted to about an equal sum to the charge for hiring.

On the expenditure side of the accounts, we find £728,552. 4s. 3d. for coals, including carriage and dues, but as the sale of coke, tar, and ammoniacal liquor, produced £335,302. 6s. 5d., or 46 per cent. on the cost of the coals, the net expenditure on that important item was reduced to £383,248. 17s. 10d. Of the other items of aggregate expenditure, there are, purifying materials, £18,014. 19s. 3d.; supervision and labour in manufacturing gas, £187,789. 11s. 2d.; repairs and maintenance of premises, tools, and implements, £122,725. 10s. 4d.; rent, rates, and taxes, on works, offices, and mains, £35,974. 4s. 10d.; salaries of secretaries and clerks in the offices, £45,651, 13s. 9d.; collectors poundage, £18,733. 11s. 6d.; stationery, printing, and general charges, £18,083. 7s. 2d.; directors, £16,435. 17s. 4d.; auditors, £1213. 5s. 2d.; repairs of mains and service-pipes, £69,016. 6s. 7d.; restoring and replacing meters, £20,922. 13s. 7d.; and law and parliamentary charges, £14,832. 4s. Six companies return their bad debts and allowances at £5108. 2s. 10d. on a rental of £574,901. 18s. 4d., being less than 1 per cent., but no notice is taken of these reductions in the returns of the other seven companies. In the Great Central Company's account there appear, on the expenditure side, the sum of £2500 as the first instalment paid on account of the Wood Street fire, and £1035. 1s. as "award *re* Croll."

The dividends of the several companies vary considerably, as the per centage paid on portions of the capitals raised at various times often differs. The total capital of the Chartered Company is stated to be £719,460, raised under the authority of four Acts of Parliament, the first of which was passed in the 50th of George III.; and the dividends paid during the year 1861, amounted, on an average, to 7 per cent. The share capital of the City Company is £364,000, and the average dividend was 6 per cent. The Commercial Company's share capital is £289,239; on which they paid, in 1861, the maximum dividend of 10 per cent. The Equitable appear, from their account, to have paid dividends in excess of 10 per cent., for the share capital is stated to be £240,000, and the dividends amounted to £26, 211. 14s. 7d. The Great Central, notwithstanding the adverse circumstances which diminished the profits of the company, shared last year 6 per cent. on their capital of £172,160. The capital of the Imperial consists of £1,072,500 in shares; of money borrowed at 4 and 5 per cent., £124,000; profits capitalized, £338,402. 15s. 9d.; and a sum received in anticipation of calls on shares, amounting to £44,852. 10s.; making together, a total capital of £1,579,755. 5s. 9d. Exclusive of the interest paid on the money borrowed, and on profits capitalized, the dividends paid were 10 per cent. on £1,007,435, capital-stock, "and 2 per cent. on £812,500, capitalized stock, to raise the dividends to the 31st of December, 1857, to 9½ per cent." The Independent Company were also in a position to pay a portion of the back dividends, besides paying 10 per cent. for the year, on £120,000, capital-stock; the "short-paid 1854" amounting to £1,500. The average amount of dividends of the London Company was 6 per cent. on their capital-stock of £547,427, a balance of £5085 being carried to this year's account. The Phœnix have no borrowed money; and, on their paid-up capital of £495,000, they paid an average of 9½ per cent. The capital of the Ratcliff, which is the smallest of the metropolitan gas companies, is stated to be £90,000; and the dividends amounted to £6. 17s. 6d. per annum. The South Metropolitan paid 10 per cent., on their capital-stock of £152,000, leaving a balance of £9901; and, in consequence, they made a further reduction to their customers of 2d. per 1000 feet of gas, from Christmas, 1861. The dividends on the Surrey Consumers share-capital of £149,994 was 8 per cent. The Western, the only metropolitan gas company not incorporated by Act of Parliament, have a paid-up share-capital of £216,000. Their dividend account shows "distribution out of profits earned previously to the passing of the Metropolis Gas Act" amounting to £5250; the payment of dividends, at the end of 1861, of 9 per cent.; and a balance carried to next year's account of £10,001. 18s. 4d.

It will be seen, from the foregoing statement of the dividend accounts of the several metropolitan gas companies, at the end of last year, that they were all then in a prosperous condition, their rentals having, in nearly every instance, been considerably greater than in any year preceding; and we believe that, when the accounts for 1862 are published, they will exhibit a still further increase of revenue. The operation of the Gas-Works Clauses Act has caused the South Metropolitan Company to reduce its price, and they are now supplying gas of great purity, and of higher illuminating power than required by the Act, at 4s. per 1000 feet in the home district. None of the other companies have yet accumulated reserve-funds sufficient to bring them within the operation of the limitation clause of the Act, but several of them are approaching the point at which gas consumers will be enabled to share in their prosperity. There is much difficulty in analyzing the returns, for several of the gas companies have not complied strictly with the form in which the Secretary of State for the Home Department required the accounts to be made. One company, for instance, has included "retorts" under the head of "tools," and four of the companies have not separated the item of "tools" from that of "ordinary repairs and maintenance of premises." In several instances, the rates and taxes paid on the works have been blended with those paid for the offices; while some companies have a separate account of the rates and taxes paid on the mains. In some cases, also, the salaries of inspectors and lamplighters wages have been included among the expenses of distribution, which appear to have been placed by other companies under the head of expenses of management. This want of uniformity in the accounts diminishes their value as the means of comparing the relative conditions of the different companies, and there are other defects in the returns which we hope to see corrected in future years. Several important items are classed together that it is important should be separately stated. It is, for example, very desirable, at the present time, when the question of public lighting is a bone of contention, that the rates charged on the works and mains of the gas companies should be distinctly brought forward, apart from rent and taxes, so that the amount extracted from them for the privilege of breaking up the streets should be known.

The balance-sheets presented at the half-yearly meetings of the metropolitan gas companies, which have for a long time past appeared in our columns (with the exception of the accounts of the Imperial and of the Independent Companies), have given our readers the means of comparing the progressive condition of each company; and the principal novelty in these returns made to the Home Secretary are their nearer approach to uniformity in the manner in which the items are classed; and they are valuable as collecting together, within a few pages, the information that has hitherto been scattered over a large space at different periods of the year.

These official accounts of the affairs of the London gas companies will give some employment to Mr. Hughes, who will, no doubt, set to work to make out tables, showing, from the money expended in coals and other items, how badly some of the companies manage their works, and how much better it would be for them and for the public if he were appointed dictator over all. One fact, however, which comes prominently forward in the examination of these accounts—that the cost of coals is only reduced 46 per cent., on the average of the thirteen accounts, by the sale of all the residual products, even at their present enhanced prices—is sufficient to prove the fallacy of his statement, that the price of coal is of little consequence in the cost of manufacturing gas. We recommend especially to his notice the proportion which the cost of coal bears to the residual products in the accounts of the Western Company, who supply only cannel gas; and, when he perceives that the coals cost £30,877, and that the sale of all the residual products only realized £6189, even his eyes must be opened to the conviction that, in the manufacture of the best kind of gas, at least, the price of coal deserves consideration. There may be items of expenditure in the accounts that his reforming hand might cut down; and we particularly direct his attention to the item of £14,832. 14s. for law and parliamentary charges, the greater portion of which was occasioned by his agitation against the metropolitan gas companies, which has thus entailed a charge on the public, by prolonging the time at which they may claim from the companies a reduction in the price of gas. Mr. Penfold, also, will probably exercise his vocation on these accounts, and he may base on them some ingenious calculations to increase the rates, by showing for how much the works that yield such large profits might let to a tenant. The publication of the rates now exacted from those undertakings would, however, show that he has already extorted from them more than they ought reasonably to pay; and the approximation of the time when the metropolitan public will be benefited by the prosperity of the gas companies, will, it is to be hoped, induce local authorities rather to promote the welfare of those companies, than to do anything to annoy them, or to delay the time when the payment of the maximum dividends allowed by the Gas-Works Clauses Act will ensure a reduction in price, and identify the interests of the sellers and of the consumers of gas.

We insert below, a protest of the gas-meter makers who have not exhibited at the International Exhibition, against the injustice done to Mr. W. Richards, in the omission of the jury to award to him the highest honour in their gift for the interesting and instructive collection of gas-meters exhibited by him, in Class XXXI. B; and, more particularly, for the slight cast upon him in ignoring his claim to their notice, as the inventor of the dry meter, now so extensively used. We pointed out the omission when the awards were first announced; and this spontaneous expression of the opinion of so many of his brethren must amply compensate Mr. Richards for any annoyance or disappointment he may have felt at the incompetency or inexperience of the jury.

INTERNATIONAL EXHIBITION.

Mr. W. Richards, Gas-Meter and Apparatus Manufacturer,
Clerkenwell. *Aug.* 3, 1862.

Dear Sir,—We, the undersigned gas-meter makers, non-exhibitors at the International Exhibition, observing, from the published list of awards, that you have been distinguished by "Honourable Mention" only, desire to convey to you an expression of our sense of the want of discrimination shown by the jurors of Class XXXI., Section B, in respect to the merits of your articles, and of the injustice done to you in consequence. The beautiful and instructive series of models which you exhibit, illustrative of the various and most important kinds of wet and dry gas-meters, inclusive of those which you actually manufacture; the excellence of their workmanship; and the originality you have displayed as an inventor; ought, in our opinion, to have secured you the highest testimony of approbation.

We trust this voluntary testimony from us will be of advantage to you, and, in some measure, compensate for the disappointment you have been so undeservedly subjected to.

WALTER FORD, 2, Foundling Terrace, Gray's Inn Road.
JOSEPH BOULTON, 28, Bagnigge Wells Road.
F. W. HARTLEY (for A. WRIGHT), 55, Millbank Street.
WILLIAM SMITH, 21, King Street, Snow Hill.
JAMES MEACOCK, 7, Snow Hill.
JOHN BEVERLEY and SON, Leeds.
HENRY JONES, 136, Old Street, St. Luke's.
STEVENS and SON, Darlington Works, Southwark.
C. R. MEAD, Sugden Terrace, Peckham.
FREDERICK HUDSON, 227, Blackfriars Road.
D. HULETT, 55, High Holborn.

Correspondence.

A WORKING MAN'S GRIEVANCE.

SIR,—I wish to call your attention to the fact that some of the parties advertising in your JOURNAL for workmen, after receiving the applications, with *testimonials* (not copies), do not think of the serious inconvenience they put a workman to by their retention of original testimonials. I have replied to two advertisements—each of which called for testimonials—and can neither obtain a reply *pro* or *con*, or the return of the testimonials, although I have sent repeatedly. Employers are very chary of giving a man more than one certificate; and I think it only fair that employers, when suited, should at once return them, so as to give a working man the opportunity of applying elsewhere. A WORKING MAN.

Register of New Patents.

2851.—EDWARD CURTIS KEMP, of Avon Place, Pershore Road, Birmingham, Warwick, agent, for "*Improvements in gas-lamp glasses, and other fittings.*" Patent dated Nov. 13, 1861.

These improvements relate to gas-lamps, their glasses, and tops. The first part consists in constructing the framework, or parts that retain the glass of a hall-lamp, so that a single nut and screw at the top of each pillar or upright bar thereof, serves to unite the upper frame and the radial arms, by which the lamp is supported and suspended from the centre. To effect this, the lower glass frame is formed with internal lugs, on which the glass rests, and into which the pillars are fitted by screws, or otherwise. The upper glass frame has like lugs attached, or in connexion with the stretcher or gas-box, by which the whole is suspended; the upper ends of the pillars pass through the wider parts, or lugs, and receive the radial arms; thumb or other nuts at top secure the whole together. The pillars are disposed on the interior of the glass, which may be cylindrical, or of other form desired.

Another improvement in these lamps consists in supporting them by a hook and eye from the gas-pipe in such way that the lamp can be unhooked at pleasure, without interfering with the gas-duct, which is continued by a small pipe passing from the main supporting pipe down within the interior of the lamp. This is made to jut out a little from the side of the main-pipe before turning down, in order to clear the hook and supporting part of the lamp, which hangs concentrically with the main-pipe.

The next part of the invention relates to gas and other lamps, and their glasses and shades, and to the method of applying and fixing them to the fittings. These glasses or shades are generally supported by a triangular piece from the bottom, which throws a disagreeable shadow downwards. Now, according to this invention, they are supported from the upper part, and for this purpose: The glass is made somewhat in the form of an inverted parabola, or bell-shape—that is to say, with the large end uppermost. This is formed with a lip, which is inserted within a ring, fixed horizontally at the termination, and on a level with the gas-arm of the lamp or chandelier, or other fitting. The glass rests on two lugs within the ring, and is inserted from below and fixed by means of a screw opposed to the two lugs. The gas is conducted by a small pipe from the arm, and descends within the parabolic shade to a suitable point; an opening being made in the bottom of the shade for the admission of air. A top or cover is applied, according to this invention, which harmonizes with the contour of, and completes the above form and arrangement of shade. This cover consists, first, of a disc of metal, in which one or more concentric steps are formed, one of which drops and fits more or less closely the upper opening of the glass. An opening is formed in the centre of this disc, which serves to receive and sustain the fire-clay top, in which are apertures for the escape of the products of combustion from the shade; more apertures may be made through the disc-piece, if necessary. This form of top is also applied to ordinary lamp-glasses and shades, in which the ornamental ring is applied and affixed to the outer diameter of the disc-piece. This may also be the case in its application to the improved shade, as such ornamental ring so affixed to the disc may encircle and cover a plain ring supporting the shade. By this arrangement of the stepped disc-piece, in combination with the fire-clay top, no individual fitting of the top to the glass is necessary, as is the case with the ordinary tops of gas-glasses and shades.

These glasses above described, and the means of fixing them, are equally well adapted for hall-lamps, or other single lights, by suspending and supporting a ring from a central pendant pipe, by suitable radial arms, the gas-pipe descending within the glass, as before. The opening at bottom of these glasses may be ornamented by an open metal-work, or other piece, to permit the entrance of the air. These single-light glasses are surmounted by a flat disc-like shade, which encloses more or less the upper part of the glass. Glasses fitted and applied in this manner can be as readily removed for cleaning or other purposes as an ordinary gas-glass.

2862.—ALFRED EDWIN CARTER, of the West Middlesex Water-Works, Kensington, and THOMAS HACK, of the West Middlesex Water-Works, Hammersmith, both in Middlesex, for "*Improvements in screw-cocks.*" Patent dated Nov. 13, 1861.

This invention has for its object improvements in screw-cocks. In screw-cocks where the valve is actuated by a screw, the stem of which passes through a stuffing-box—and this at present can only be done when the pressure of the water or other fluid is removed from the cock, as otherwise the water or fluid would escape around the stem of the screw; and, in practice, it is frequently very inconvenient to relieve the valve of the pressure of water or fluid for this purpose. To avoid this inconvenience, a water-tight joint is formed between the upper surface of the thrust-collar, on the stem of the screw, and the under-side of the cover of the valve-box; so that, when the valve is shut down, and the upper-surface of the thrust-collar pressed strongly against the under-surface of the cover, the escape of water or fluid around the stem of the screw is prevented,

even when the packing is removed; and, as this water-tight joint, in order to be of any service, must be so constructed as to shut closely, not only when first made, but even after the parts have been long exposed to the corrosive action of the water or fluid, a ring of brass or other suitable metal is let into the cover of the valve-box, around the hole, for the passage of the stem of the screw, and the same turned—by preference, concave. The thrust-collar on the screw (which it is preferred should be of brass) is turned convex on its upper side, and it is ground into the ring to let into the cover, as is ordinarily practised in making valve-joints. By this arrangement, it is obvious that the packing may be removed, whilst the valve is still exposed to the pressure of the water or fluid, it being necessary only to shut the valve closely.

2864.—JOHN LESLIE, Esquire, of 60, Conduit Street, Hanover Square, London, for "*Improvements in the manufacture of gas.*" Provisional protection only obtained. Dated Nov. 13, 1861.

This invention has for its object improvements in the manufacture of gas. For these purposes, in order to manufacture gas more advantageously from hydrocarbon fluids, the following are the means employed: The hydrocarbon fluid is caused to flow or drop down a tube, or series of tubes, by preference in an upright position, within an outer vessel, or retort, which is heated externally. This may be conveniently done by a furnace below the lower end of the vessel, or retort, together with a spiral flue around the exterior of the retort, or vessel. At the lower end of this retort, or vessel, is a smaller retort, or chamber, which may be separate from, or form part of, the retort, or vessel, first mentioned. From the upper part of this smaller retort, or vessel, rises an outlet-pipe, through the first-mentioned vessel, or retort, up which pipe the gas passes from the smaller retort for use. The hydrocarbons descend by the tube, or tubes, nearly to the outer surface of the smaller retort; and the products thus caused to be evolved from these fluids will ascend to the other end of the first-mentioned retort, from whence such products then descend through another tube, or series of tubes, which, at their lower ends, are connected to the smaller vessel, or retort, and, consequently, the products evolved external of the smaller, or inner, retort, are conducted, by such tubes, into the smaller retort, or vessel, by which the hydrocarbons, and the products evolved therefrom, will be caused to pass through very extensive heated surfaces, before the gas thus obtained is conducted away out of the apparatus for use by the outlet-pipe rising from the smaller retort, or vessel.

2862.—GEORGE HAWKSLEY, of Three Mill Lane, Bromley-by-Bow, Middlesex, for "*Improvements in apparatus for sounding alarums and actuating ventilators.*" Provisional protection only obtained. Dated Nov. 14, 1861.

This invention has for its object improvements in apparatus for sounding alarums and actuating ventilators. For these purposes, apparatus is combined, as hereafter described, in order that an alarum may be sounded, or a ventilator opened, when the temperature of a room, or an apartment, or other locality, is increased beyond that at which the apparatus is set to go off. A strip of metal, which expands freely with heat—by preference, of zinc—is attached, at one end, to a screw, or other instrument, which is capable of being moved or adjusted. The other end of this rod is attached to the shorter end of a lever, mounted to a fixed centre, and to the longer end of which is attached one end of another expansive strip; and the other end of this second strip is attached to the shorter end of a second lever, which in turn has a third expansive strip attached to it, and so on; the number of strips employed depending on the degree of delicacy required in the instrument. The levers may be made of any suitable material, and their axes may be carried by wood, or other material not largely acted on by heat. The last of the series of levers is connected with a spring, or other suitable instrument, which keeps the expansive strip at all times in a state of tension. The last of the series of levers carries the instrument which acts on the detent or stop of the sounding apparatus, or of the power apparatus for working the ventilator; and such last lever is made with a point, which moves over or opposite a graduated scale, commencing at zero, and so divided that, if the lever, by the screw or adjusting apparatus, is moved to a particular degree or division on the index, the apparatus will go off when the heat rises to the extent above the temperature at which the thermometer stood at the time of setting the apparatus.

2944.—JOHN WEEMS, of Johnstone, Renfrew, N.B., tinsmith, for "*Improvements in the manufacture of metallic tubes, and in coating or plating metals.*" Patent dated Nov. 23, 1861.

This invention relates, firstly, to the manufacture of metal tubes, with a view of producing a cheap substitute for brass, or other similar tubing. Under one modification, zinc tubes are formed by passing the metal strips through dies or rollers; and the overlappings or contiguous edges of the metal are brazed or soldered with the aid of the blow-pipe, or other equivalent means. The tube may then be passed through a die, or other suitable aperture, in order to impart a smooth finish thereto. The tube is then to be coated with copper, either by means of a galvanic battery, or by immersion in cold or heated solutions of the salts of copper, suitable for precipitating the metallic base upon the surface of the tube. These tubes may also be coated or plated with compound solutions of metals, so as to deposit a metallic alloy upon the surface of the tube; or its surface may, if preferred, be coated with tin and its alloys, or bronzed or lacquered.

2949.—EUGÈNE ALEXANDRE ROUVIÈRE, aîné, of 51, Rue de Malte, Paris, France, for "*An improved pump.*" Patent dated Nov. 23, 1861.

The principle of this improved pump consists in the employment of two pistons of different diameters, which are firmly secured to each other, and work together in a pump-barrel, composed of two barrels, or portions, of different diameters, so that, as the pistons move or travel in their respective "barrels," the capacity of the space comprised between them shall be continally undergoing variation, being either increased or reduced according to the direction in which the pistons travel; by which means the forcing and suction of the water or liquid are effected.

2962.—JOHN HALFORD, of Beacon Cottage, Great Barr, Stafford, for "*Improvements in collecting and utilizing smoke, gases, and such like products of combustion, rendering the same available for heating steam-boilers, and other purposes where heat is required, which improvements are also applicable to the desulphurization of coal in making coke.*" Provisional protection only obtained. Dated Nov. 25, 1861.

In applying this invention to coke-ovens or open coke-fires, or heaps, instead of the chimney, or chimneys, now ordinarily used, a close-built, or solid, chimney is constructed, which is closed at the top. Through the sides of this, and near the top, holes are left, which encircle it, placed at such distances apart as may be required. This solid chimney is enclosed in another of the same kind as is now ordinarily made use of, or one constructed in any manner so as to draw off the smoke and other combustible product of the coal; and this outer chimney is either connected with the inner one at the top, or not, according to circumstances. The outer chimney has the effect of drawing off the smoke, gases, and such like products from the burning coal, and conveying the same to the holes near the top of the solid chimney, through which they descend, into a pipe or flue, which is constructed at the bottom of the fire, either on or under the surface of the ground, and which is either extended to the place wherein the heat is to be applied, or discharges itself into a main-flue, or pipe. Where a main-flue is made use of (which, like the smaller, or subsidiary, flues, is carried either along or under the surface of the ground), the same is extended to the boiler, or to any other place where the heat is to be applied. As soon as the smoke arrives underneath the boiler, it is ignited, and the heat given therefrom serves, either partially or totally, instead of ordinary fuel. From the increased draught caused by this means of burning coal into coke, the sulphur is more effectually extracted from the coke than by the ordinary method.

In applying this invention to works and manufactories, the smoke, as soon as it reaches a convenient height, is conveyed up an ordinary chimney, or stack, and thence through a chimney, or flue, attached to the first chimney, and either on, under, or above the surface of the ground, to the place where the heat is to be applied into another flue, or on the plan adopted in regard to coke-ovens, or open coke-fires, or heaps.

In open coke-fires, the fire must be covered with coke, or mine-dust, or some substance of the same kind. If desirable, retorts are placed in any place deemed most suitable, in the open coke-fire, or in coke-ovens, or in any convenient position, in a chamber connected with the main, or smaller flues, where the smoke may be ignited for the collection of the gas emitted therefrom.

2985.—AMOS WHIBLEY and THOMAS LUMLEY, both of Gloucester Grove East, Old Brompton, Middlesex, carpenters and joiners, for "*Improvements in ventilators.*" Provisional protection only obtained. Dated Nov. 27, 1861.

This invention consists in constructing the louvres of ventilators of oiled silk, cotton, cloth, or other suitable flexible material, instead of wood or metal, as heretofore commonly practised. For example, a sheet of zinc, iron, wood, or other suitable material, is taken, and pierced with a convenient number of holes; and, to the top of this plate, and on one side of the said plate, is fixed a piece of oiled silk, cotton, cloth, or other suitable flexible material, so that it shall hang over and cover one side of the plate, so that a current of air blowing on that side of the plate which is not covered with the silk will pass through the holes in the plate, and, raising the oiled silk, will be allowed to escape; but any current of air blowing on that side of the plate on which the silk is placed will press the said oiled silk against the plate, and thus close the openings in the said plate, and prevent the passage of the air

2993.—MAGNUS OHREN, of Sydenham, Kent, Associate of the Institution of Civil Engineers, for "*An improvement in the manufacture of gas, and the apparatus connected therewith.*" Provisional protection only obtained. Dated Nov. 27, 1861.

It being a known fact, that, although a gas-exhauster, working at level gauge, draws off a considerable portion of the gas produced in a retort, still a pressure is maintained in the retort equal to the seal of the dip-pipe, from two to four inches, and that, consequently, a large portion of gas is thereby destroyed in the retort, the inventor claims to remove this pressure from the retorts; and, for the most efficient means of doing so, he claims the use of a moveable disc, whereby the water in the hydraulic main is kept at one uniform level—just sufficient to seal the pipe when the retort is at work. The disc can be raised or lowered most effectually by the use of a screw and wheel, with a pointer attached, to show the lineal opening. On the moveable disc being lowered, the water from the hydraulic main will flow away, and the pressure will be removed from the retort to such an extent, that the whole of the gas evolved can be drawn off by the exhauster at level gauge. It will be necessary, when the exhauster is stopped, to raise the disc, so as to give the full seal in the hydraulic main; otherwise, the back pressure will unseal the dips, and allow the gas to pass down the ascension-pipes, when the retorts are being drawn.

APPLICATIONS FOR LETTERS PATENT.

2341.—SANDIFORTH FEATHERSTONE GRIFFIN, of the New Adelphi Chambers, Strand, London, W.C., civil engineer, for "*Improvements in apparatus to be used in the distillation of petroleum or any oleaginous, resinous, or alcoholic bodies.*" Aug. 22, 1862.

2359.—CARL HEINRICH ROECKNER, of Marsh Street, Bristol, for "*Improvements in syphons for discharging or drawing off large bodies of water, and in the mode of charging, fixing, and constructing same, whereby they are rendered perfectly self-acting.*" Aug. 23, 1862.

2371.—GEORGE DAVIES, of No. 1, Serle Street, Lincoln's Inn, London, W.C., and 28, St. Enoch Square, Glasgow, N.B., civil engineer and patent agent, for "*A machine for singeing woven fabrics of cotton, wool, or silk, by means of gas or alcohol.*" A communication. Aug. 27, 1862.

2373.—JOHN AMBROSE COFFEY, of 4, Providence Row, Finsbury Square, London, E.C., and THEOPHILUS REDWOOD, of 19, Montague Street, Russell Square, London, W.C., for "*Improvements in the manufacture of salts of ammonia, and other products from the ammoniacal liquors of gas-works, and animal-charcoal works.*" Aug. 27 1862.

2379.—Richard Archibald Brooman, of 166, Fleet Street, London E.C., patent agent, for "*Improvements in machinery for separating or sorting and washing coal, and other minerals.*" A communication. Aug. 27, 1862.

2380.—William Edward Newton, of the Office for Patents, 66, Chancery Lane, London, W.C., civil engineer, for "*An improved method of producing light for the various purposes of artificial illumination.*" A communication. Aug. 27, 1862.

2385.—Joseph Kitchin, of Liverpool, Lancashire, ventilating engineer, for "*Improvements in ventilators.*" Aug. 28, 1862.

2390.—Elizabeth Lachenal, of Little James Street, Bedford Row. London, W.C., for "*Improvements in gas-meters.*" A communication, Aug. 28, 1862.

2391.—William Husband, of Hayle, Cornwall, for "*Improvements in water-valves.*" Aug. 28, 1862.

2400.—George Walter Dyson, of Tinsley, Yorkshire, forge and mill manager, for "*Improvements in machinery for finishing and polishing circular metal rods, bars, and shafts, applicable also to the manufacture of metal tubes and pipes.*" Aug. 29, 1862.

2412.—John Gay Newton Alleyne, of the Butterley Iron-Works, Alfreton, Derbyshire, and Julius Roberts, of 3, Essex Court, Temple, London, E.C., captain in the Royal Marine Artillery, for "*Improvements in the manufacture of flanged wrought-iron or steel plates, or of wrought-iron beams and frames of a trough-shaped section.*" Sept. 1, 1862.

2421.—William Clark, of 53, Chancery Lane, London, E.C., engineer, for "*Improvements in the means of obtaining light and heat, and in apparatus for the same.*" A communication. Sept. 1, 1862.

2423.—John Henry Johnson, of 47, Lincoln's Inn Fields, London, W.C., and 166, Buchanan Street, Glasgow, N.B., gentleman, for "*Improvements in apparatus for regulating or controlling the working of motive power engines, applicable also to the regulation of the flow of liquid, air, or gas, through pipes or conduits.*" A communication. Sept. 1, 1862.

2424.—David Bruce Peebles, of Edinburgh, N.B., engineer, for "*Improvements in wet gas-meters.*" Sept. 2, 1862.

2426.—William Hunt, of Tipton, Staffordshire, manufacturing chemist, for "*An improvement or improvements in the manufacture of muriate of ammonia.*" Sept. 2, 1862.

2430.—William Roberts, of Millwall, London, E., for "*Improvements in apparatus for regulating the amount of water discharged by a pump, chiefly applicable for regulating the amount of water thrown by a steam fire-engine, or for regulating the amount of water fed to a steam-boiler.*" Sept. 2, 1862.

GRANTS OF PROVISIONAL PROTECTION.

2233.—Alexis Jean Moreau, chemist, and Adolphe Ernest Ragon, gentleman, both of Bernard Street, Russell Square, London, W.C., for "*Improvements in the mode of, and apparatus for, treating bituminous and carbonaceous substances for the purpose of obtaining the various products, volatile liquid and solid, which they contain, and also in the treatment and application of such products.*" Aug. 9, 1862.

2267.—John Cooper, of Town Malling, Kent, plumber, for "*Improvements in valves and buckets for pumps, and in valves or cocks for other uses.*" Aug. 13, 1862.

2303.—James Newman, of Birmingham, Warwickshire, jeweller, for "*Improvements in machinery for the manufacture of metallic tubes.*" Aug. 15, 1862.

2313.—Frederic Barnett, residing at 164, Rue de Rivoli, Paris, late of 230, Oxford Street, London, W., for "*An improved lamp or lantern for street-lighting, and other purposes.*" Aug. 18, 1862.

2321.—Victorin Florentin Clevet, of 182, Rue d'Allemagne, Paris, engineer, for "*An improved self-acting apparatus for supplying boilers with water, applicable also to the raising and to the measuring of liquids.*" Aug. 19, 1862.

2341.—Sandiforth Featherstone Griffin, of the New Adelphi Chambers, Strand, London, W.C., for "*Improvements in apparatus to be used in the distillation of petroleum or any oleaginous, resinous, or alcoholic bodies.*" Aug. 22, 1862.

2359.—Carl Heinrich Roeckner, of Marsh Street, Bristol, for "*Improvements in syphons for discharging or drawing off large bodies of water, and in the mode of charging, fixing, and constructing same, whereby they are rendered permanently self-acting.*" Aug. 23, 1862.

2380.—William Edward Newton, of 66, Chancery Lane, London, W.C., civil engineer, for "*An improved method of producing light for the various purposes of artificial illumination.*" A communication. Aug. 27, 1862.

NOTICES TO PROCEED.

1100.—David Stott, of the firm of John Whiteley and Son, of Firth House Mills, Stainland, Yorkshire, paper manufacturers, for "*Improvements in the manufacture of rings from paper, millboard, or pasteboard, applicable for steam or other pipe-joints, bobbin-ends, or other purposes, and in the means or apparatus employed therein, which are also applicable to the manufacture of rings from other flexible substances.*" April 16, 1862.

1165.—Christopher Crabb Creeke, of Bournemouth, Hants, architect and surveyor, for "*Improvements in the construction of drain and other pipes.*" April 21, 1862.

1191.—John Endeau, of Lock's Fields, Walworth, London, S., brass-founder, for "*Improvements in cocks, taps, and valves.*" April 24, 1862.

1204.—Rudolf Zimra, of St. Petersburg, Russia, engineer, for "*Improvements in stoves for heating and ventilating buildings.*" April 24, 1862.

1289.—Charles Pierre Alexandre Douchairn, of St. Cloud, France, engineer, for "*Improvements in apparatus for letting in or shutting off water or other liquids.*" May 1, 1862.

1414.—Henry William Sambridge, of Birmingham, Warwickshire, manufacturer, for "*Improvements in sliding chandeliers, gaseliers, and other pendent lamps.*" May 10, 1862.

2025.—Frederick Major Parkes, of Plumstead, Kent, gentleman, for "*Improvements in the manufacture of gas for lighting and heating, and in apparatus employed in the said manufacture.*" July 14, 1862.

2105.—Touissant Lemaistre, architect, of 3, Rue de Grammont, Paris, for "*Improvements in privies.*" July 24, 1862.

PATENTS WHICH HAVE BECOME VOID

BY REASON OF THE NON-PAYMENT OF THE ADDITIONAL STAMP DUTY OF £50 BEFORE THE EXPIRATION OF THE THIRD YEAR.

1901.—Hyam Jacob Hyams, "*Improvements in the construction of wet gas-meters.*" Aug. 18, 1859.

1920.—Henry Parkes, "*Improvements in the manufacture of cylinders and tubular or hollow bodies of copper, and alloys of copper, or other ductile metals.*" Aug. 22, 1859.

1922.—Oliver Maggs, "*Improvements in taps, cocks, or valves.*" Aug. 22, 1859.

1954.—Thomas Craven, "*Improvements in ball-cocks or valves.*" Aug. 27, 1859.

Legal Intelligence.

CAPEL STREET POLICE-COURT, DUBLIN.

THURSDAY, AUG. 28.

(*Before Mr* STRONGE.)

CHARGE OF DEFRAUDING THE ALLIANCE AND CONSUMERS GAS COMPANY.

Angus Mackenzie and *John Bain*, gasfitters, carrying on business at 106, Capel Street, appeared on summons to answer the complaint of the Alliance and Consumers Gas Company, for having defrauded the company of a quantity of gas by the surreptitious insertion of a certain pipe in the service-main.

Mr. J. A. Curran, instructed by Mr. J. Macnamara Cantwell, appeared for the company; and Mr. O'Meara for the defendants. Mr. Stevenson, the secretary of the company, was also present.

Mr. O'Meara said, he had a preliminary objection to the summonses, which, he contended, should be dismissed, on the ground that his clients, who were a firm, should have been sued as such, and not as separate individuals.

Mr. Stronge inquired under what Act of Parliament the prosecution was instituted?

Mr. Curran stated, that it was the 10th Vict., cap. 15, section 18, which provided for the regulation of gas companies. As to the objection of Mr. O'Meara, no one had ever heard of partners being sued by their corporate name.

After some discussion,

Mr. Curran said, to remove any difficulty, he would be satisfied to proceed against Mr. Mackenzie alone, and not against both defendants.

Mr. Stronge said, that he was quite certain that Mr. Curran could proceed against one of the defendants. If he did so, and proved that the defendant was personally cognizant of the act complained of, it would be no defence to the proceedings that he was a member of a firm, and that others should have been sued with him. At the same time, he was not sure that the firm might not have been proceeded against.

Mr. Curran said, the firm might have been sued jointly, provided it could have been shown that they acted jointly in the matter. He would now proceed to detail the facts of the case. The Act of Parliament was very clear and very stringent. It provided certain fixed penalties for the laying down of any pipe, or pipes, communicating with any pipe belonging to the directors of any gas company without their consent. Mr. Mackenzie and his partner had been in the employment of the Alliance Gas Company, as gasfitters, for six or seven years before they had set up in business themselves. About the month of November last, they got a service of gas from the company with a ten-light meter. Matters went on until the company received certain information, the origin of which he (Mr. Curran) was not at liberty to disclose. On receiving that information the officers of the company went to the premises of the defendant, and made an examination on August 14. They perceived near where the meter was placed the appearance of fresh plaster on the wall; but, not liking to proceed further without consulting the directors, the result was that Mr. Mackenzie tendered an explanation, and admitted that he had done what was not right. The following was an extract from his letter:—

I also wish you to call over respecting a report which some of your people have circulated, which is very unjust, and extremely rash. Whoever the parties were that came here, they ought to have made a proper examination of the fittings, or waited until Mr. Bain or myself came, when we could have shown and explained the whole matter, and shown their mistake. We expected them to call again every hour about the matter, and they have not done so. We would, therefore, wish you to call, and bring the party with you, when you can see the fittings, precisely as they left them. I am, dear sir, yours respectfully, A. Mackenzie.

That letter was addressed to Mr. Henry O'Dell, the chief inspector of the company, whom he would now examine.

Mr. *Henry O'Dell*, examined by Mr. Curran: I am chief inspector of the Alliance and Consumers Gas Company. I recollect, from information received, going to the defendant's establishment in Capel Street. I made an examination of the premises and meter. I did not see any one on the premises but the clerk: neither Mr. Mackenzie nor his partner were in. I made an external examination only.

By Mr. Stronge: I mean an external examination as regards the fittings and meter; it was internal as regards the premises.

By Mr. Curran: The extent of plastering which we removed was about 18 inches by 6, in a diagonal direction.

Mr. Stronge: Did it appear to have been recently removed; was it soft?

Witness: No, sir, it was not soft; but it was a different colour from the surrounding plaster.

By Mr. Curran: I was not there the second day; but I was accompanied on the first occasion by Mr. Lalor, who will tell the same story. [Witness then, by means of a model, showed the position in which the surreptitiously-introduced pipe had been discovered, and the means by which it facilitated an increased consumption of gas, not indicated by the meter, and for which the company, consequently, could not get credit.] The letter from which an extract had been read was addressed to him (witness.) I went to the defendant's place the next day, in accordance with that letter. I saw Mr. Mackenzie, who told him that the pipes surreptitiously introduced were intended for taking pressure, or to test the strength of the gas in the pipes.

Mr. Curran: Was that a proper way of taking pressure?

Witness: Certainly not; no gasfitter has a right to do it. When I went into the workshop, the gas was burning, although the main cock was turned

off. I asked for an explanation of that circumstance; and I was told that the cock had been filed down so as to admit of the escape of sufficient gas to give light for one man. On examining the cock, I found that statement to be incorrect.

Mr. STRONGE: What was the object of that statement?

Mr. CURRAN: To convey the impression that there was leakage, and thereby account for the burning of the gas in the workshop when the cock was turned off.

The witness was cross-examined by Mr. O'MEARA at some length, for the purpose of eliciting that he might have been mistaken as to the purpose for which the pipes had been inserted in the main by the defendant, but without effect.

Mr. *Lalor*, examined by Mr. CURRAN: I am one of the company's inspectors, and went, on the 14th, with Mr. O'Dell, to the defendant's premises, but found nothing; went on the 19th, by instructions of the board, to make another examination, and did so. I went in company with Inspector Kearney and a workman. I instructed the workman to take down the plaster near the "bend" of the service-pipe going into the street. I then went into the workshop, and found a connexion between the fittings. To satisfy myself still further, I turned off the main-cock—that is, the cock before the meter—and still there was plenty of light in the workshop. I heard Mackenzie say that he put the pipe there, and that he put it there for the purpose of obtaining pressure, and that he thought there was no harm in it. I turned off the main-cock, so that no gas could go into the meter at all. The light in the workshop, however, still continued burning as bright as ever, and with as strong a pressure as before, showing that the supply must have been obtained from another source.

Mr. O'MEARA was proceeding to cross-examine the witness, when

Mr. STRONGE said, he was surprised that Mr. O'Meara should persist in cross-examining the witness in the face of such a case as had been made for the prosecution, instead of inducing his client to plead guilty, and submit to the penalty. He did not think it possible for Mr. O'Meara to struggle against the evidence for the prosecution.

Mr. CURRAN said, that the company could have proceeded against the defendant for larceny of the gas.

Mr. STRONGE said, he had no hesitation in saying that it would be his duty, on the evidence, to commit the defendant for the larceny.

Mr. CURRAN said, that what the company thought so badly of in the present case was the fact of the defendant having been so long in their employment.

Mr. STRONGE said, he thought the defendant had better plead guilty, and withdraw the defence. He (Mr. Stronge) would fix the penalty at £5.

Mr. O'MEARA said, that his client admitted a violation of the law, in the first instance, but they never intended any fraud whatever. The course recommended by his worship would be adopted.

Mr. CURRAN said, that if any similar violation of the law were committed, they could prosecute for larceny. They were now satisfied in having vindicated the law. He wished to state that Mr. Stevenson desired that the amount of the penalty should be given in charity.

His WORSHIP directed that the penalty should be paid within a week.

Miscellaneous News.

PHŒNIX GASLIGHT AND COKE COMPANY.

The Adjourned Half-Yearly Meeting of the Proprietors of this Company was held yesterday, at the Bridge House Hotel, Southwark—J. E. JOHNSON, Esq., in the chair.

The SECRETARY (Mr. Pridden) read the notice convening the present, and the minutes of the last, meeting.

The report and statements of account (a copy of which appeared in our last number), having been previously printed and circulated among the proprietors, were taken as read.

The CHAIRMAN: I rise to move, "That the report and accounts be received, and entered on the minutes." I am quite sure you will infer, from the brevity of the directors report—as is, indeed, the case—that they have very little to say to you, but I trust that that little will be considered neither uninteresting nor unimportant. The several items in the accounts are very similar to those of the preceding half year, and I may say, also, with those of the half year preceding that. With regard to the expenditure, some of the items are comparatively a little higher and some are a little lower, but on this side of the account the diminution prevails, and, therefore, the result is favourable. On the other hand, also, with regard to the receipts, some are higher and some are lower, but, in this case, the increase prevails, and, consequently, we get a second favourable result. It is the combination of these two favourable results which leads to the considerably increased amount of profit which the accounts show, and which, the directors trust, will be regarded with satisfaction. The next point—to which I will briefly advert, is that of the call. We have been foreshadowing the necessity of a call for some time, but we have felt very unwilling to appeal to you for it until the work was in such an advanced state as to yield us some fair and reasonable expectation that we should be able to pay a dividend upon the money when obtained. Most of the money we now require we have already anticipated by appealing to, and taxing the kindness of, our friend, the treasurer, who has most readily and cheerfully advanced anything that we required. We told you, on the last occasion, that, at Christmas, we had anticipated the call by £10,000 expended upon works. This sum has, since then, been further increased to the extent of £9000, and, between now and next Christmas, a further outlay of from £6000 to £8000 will probably be made; consequently, something like £26,000 or £27,000 may be looked for as the capital essentially necessary to be called up for the well-being and proper management of this company. You will bear in mind that there are some outward signs for this expenditure. If any of the proprietors will do us the favour to go to Vauxhall, they will see that our works have been enlarged to an extent considerably greater in the enlargement than the whole of the works at Bankside, together; and those works are already in a profit-making state. During the last half year, they have been at work, and have realized profits; and I will show you by and bye, when I come to speak on the question of profits, with reference to dividend, to what extent that has prevailed. I should tell you that we have done this by money borrowed of our banker. We have been borrowing largely. In January, 1861, we borrowed £5000; in February following, to pay the dividend, we borrowed £17,000 more; making together, £22,000. We paid back £10,000 of that money, in March; £3000 in April; and £9000 in May; and so, we wiped off that debt. But in August, we borrowed £10,000 more; and in November, £5000; making together, £15,000. We then had a call of £10,000, which went in diminution of this debt; and in December, we paid off £5000; and thus, that debt was disposed of. In January last, we borrowed £12,000 more; and in March, £8000; making together, £20,000. In March, however, we paid off £5000; in April, £5000; in May, £5000; and in June, £5000; thus clearing off that loan, but leaving us with next to nothing at our bankers, after nothing wherewith to go on, after having expended a considerable sum of money which really belonged to the working capital of the company, and, without which we could not do. Thus it is we stand; and hence it appears that, during the whole of the last half year, we have been in debt to our banker. We are now borrowing again a considerable sum; and without your kind assistance, there will be no possible means of paying it off, and we shall be left continually in debt. That is a thing which you, as a body of gentlemen, looking at this as a commercial concern, will clearly see is neither judicious as a present arrangement, nor can it be eventually advantageous. You may have a kind treasurer, who will assist you when necessary; but it is not right to spur a free horse too freely, and you must not press too heavily upon the kindness of even a kind man. The consequence is that we intend to propose to you a call; and what has to be said upon that subject I shall leave to the gentleman who will submit the resolution. Now, with regard to the dividend. Here is a sum of £27,452, which is the profit realized during the half year, and which is sufficient to pay a dividend upon the total subscribed capital of 10 per cent., and also certain charges which fall upon the profits, leaving a surplus of £1673. There is, consequently, a provision already made to meet the dividends upon any call you may think proper to allow. There is in this half year, £1673 of undivided profits beyond the 10 per cent.; but that is not the whole of the accumulation. At Christmas last, there was a little surplus of £56; and, at Midsummer, 1861, a surplus of £2152. These three sums together amount to £3881; and there was an amount of undivided profits at Christmas, 1860, of £4681. Now, we feel this—we know by experience that gas companies are exposed to vicissitudes and great accidents. Only within the last few years, two have occurred with other companies, which have involved them in considerable expenditure; and it would not be judicious, in a large company like this, to have no provision for accident or casualty of that kind. Your directors, therefore, feel that the £4681 which was the amount in hand in 1860, and which was the accumulation of surplus profits before the new Act came into force, is entirely your own, at your own disposal, and can be distributed at any future time, as you think proper. But they also think it would be best that it should be reserved to meet any contingency that may arise. With regard to the £3881, that has accumulated since the passing of the Act, and must be dealt with in accordance with the provisions of that Act. One of the main provisions is this, that the profits of the company, after being applied to the payment of a 10 per cent. dividend for the current half year, shall be expended in making up back dividends during the preceding six years which have fallen short of 10 per cent. to that amount, or to as near 10 per cent. as the surplus will allow. That is the first duty the directors have to do in reference to this matter; and, consequently, they feel that, as in the year 1856 your dividends were not 10 per cent., it is but right to distribute this money among the proprietors, so as to augment those dividends, and make them as near 10 per cent. as circumstances will admit. They propose to you, therefore, in addition to the dividend at the rate of 10 per cent. for the past half year, that you should take 15s. per cent. upon the whole of the capital, in augmentation of the dividends of 1856, which will require a sum of £3510, and leave £371 to be disposed of at Christmas next, in such a manner as the proprietors may then think proper. I trust that this is an arrangement which will meet with your approval; and, therefore, remarking only that I shall be happy to answer any question which any gentleman present may feel desirous of asking, with regard to the general state of the company's works, or with regard to any particular in these items, or any other matter, I will conclude by moving—"That the report and accounts be received, and entered on the minutes."

Mr. JOSEPH BOX: I second the motion, for the following reason:—I have analyzed these accounts, and compared them with those for the corresponding period of 1861, and I find the following to be the result:—There has been a reduction in the cost of coals of 1s. 3¾d. per ton, which, upon the quantity consumed, has effected a considerable saving. The increase in the consumption of coals is 821 tons. The increase in the earnings for gas, at Bankside and Vauxhall, per 100 tons of coals, has been £5. 15s., or a total of £1669. 15s. There has been an increase, also, in every one of the products, except breeze. The increased earnings for gas on every 100 tons of coals consumed at Greenwich have been £3. 18s., making a total of £309; so that, at the three stations together, there has been an increase on the earnings for gas of £1978. 15s. This, I think, shows the very satisfactory state this concern is in. The next subject to which I turned my attention was, as to how the expenditure bore upon the revenue, and I find that there has been a reduction of 2 per cent., or a total reduction on the expenditure of £1689. 15s. Under these circumstances, I see no reason why we should withhold from the directors that which they want with regard to the call. To my mind, the statement I have made is very satisfactory, and reflects great credit upon the executive and the officers of the company, while it tends to increase and strengthen the confidence of the proprietors as to the judicious way in which their affairs are conducted.

Mr. JOHN BOX: May I ask how the income-tax was paid last half year?

The CHAIRMAN: It forms part of the amount taken from the profits.

Mr. DOANE: What was the amount of the dividend in 1856?

The CHAIRMAN: It was 6 per cent. one half year, and 5½ the other.

The motion was then put, and carried unanimously.

Mr. HORNER (deputy-chairman): Gentlemen, it falls to my duty to propose to you not the least agreeable motion of the day. We are able, as the chairman has explained, to recommend to you a dividend at the rate of 10 per cent. for the past half year as before, and we hope in future years the dividend will never be less. But, in addition to that, we are going to produce a novelty. Inasmuch as, by the Metropolis Gas Act, we are allowed to make up deficiencies in back dividends during the previous six years between any rate we have been able to pay, and 10 per cent., and as our profits for the past half year have increased something like £1500 over the half year ending Christmas, 1861, we are able to offer you a further dividend at the rate of 1½ per cent. for the year 1856, during which our profits only allowed us to divide something like 5½ or 6 per cent. It must be a subject for congratulation to the proprietors that not only are our present profits sufficient to pay 10 per cent. upon the subscribed capital, but that we shall be able to pay that dividend upon the amount raised by the call about to be made, even supposing that those profits are not increased at all between now and Christmas. Under these circumstances, the directors feel that they are fully justified not only in giving you the maximum dividend allowed for the past half year, but also a further sum in augmentation of the dividend paid for a previous year. I cannot imagine

that it is possible there should be any opposition to this proposal, and, therefore, I shall move at once—"That a dividend for the half year ending Midsummer last be, and the same is, hereby declared and made out of the profits of the undertaking at and after the rate of 5 per cent. for the half year upon the paid-up capital of the company, together with 15s. per cent. in augmentation of the dividend paid for the year 1856 upon the paid-up capital of the company at the latter period, in accordance with the provisions of the Metropolis Gas Act, 1860, and that the same be payable as heretofore immediately after the business of this meeting has terminated, and afterwards at the company's office at Bankside, on Thursday, the 28th inst., and also on Monday, the 1st proximo, on both days from the hour of twelve to three, and from that time on Wednesdays only, from two till four o'clock."

Mr. BENTLEY: I have much pleasure in seconding the motion. It must be very gratifying to the directors that they are not only able to offer us 10 per cent., but to do a little in the way of equity by discharging an old obligation, which might have been more serviceable to some of the proprietors if it could have been done earlier. However, circumstances would not admit that, and, therefore, we must be satisfied that we are able to have it now.

Mr. JOSEPH BOX: I think, we ought to have a larger sum on account of back dividend, unless, indeed, the chairman can assure us that this 15s. is but an instalment of the deficiency of dividend for 1856. I hope it is not to be an extinction of our claim for that year.

The CHAIRMAN: You must bear in mind that we can only make up back dividends for a period of six years; and as this is 1862, the year 1856 is the remotest period to which we can revert. After this year, there can be no further augmentation of the dividend for 1856; but I hope we shall be able, as Mr. Bentley has said, to do something in equity with regard to deficient dividends in subsequent years. But it is scarcely judicious for us now to be saying how we are to appropriate future profits. I think it will be wise, first of all, to secure them; and, when we have them, I am sure the directors will be glad to help the proprietors in making a judicious and satisfactory distribution of them.

Mr. JOSEPH BOX: I hope, if the profits of the next half year will enable you to do so, you will go back to 1856, and make up the dividend of that year to 10 per cent.

Mr. STEWART: I do not know whether you have taken counsel's opinion upon the subject. It is a very important question; but I should not think that Parliament intended that you should accumulate profits and pay back deficiencies in that way. If it were so, the public would have good ground of complaint against you. I think it is one year against another—that the surplus profits of one year shall go to pay off entirely the deficiency of a previous year.

Mr. HORNER: The position of things is, that you can only go back six years; and, after 1862 is out, 1856 is expunged entirely, as far as any right to make up back dividends is concerned. If we continue to pay 10 per cent., the time will come, in four or five years, when we shall not be able to go back at all. I take it that if the profit of 1862 is not sufficient to pay 10 per cent. upon 1856, you cannot go back to that year to make up the defficiency on a future occasion.

Mr. WHEELER: I think when you have a considerable profit the best way no doubt is to divide it while you can, if you do not want it for working capital. In a few years, you may not have any surplus profits, and then the advantage we may now secure will be at an end. Of course, I shall not urge the matter in opposition to the recommendation of the directors, but if you saw your way clear to it I should be glad.

Mr. HORNER: The answer to that is, that if we had seen our way to it we should have proposed it, but we did not.

Mr. WHEELER: I have every confidence in the directors that they will do their best for the proprietors, and I am perfectly satisfied with their recommendation.

Mr. JOHN BOX: When you say, "in augmentation of the dividend paid for the year 1856," I presume you mean Midsummer 1856.

The CHAIRMAN: We must take the words of the Act as they stand. The words are "for six years."

Mr. JOSEPH BOX: Unless the directors can assign some good reason to the contrary, I shall be inclined to move, seeing that we have so large a balance in hand, that instead of 15s. per cent it should be £2 per cent.

Mr. B. DREW: I apprehend that if the directors paid £2 per cent. they would have to keep on borrowing from the bankers.

The CHAIRMAN: The whole of the reserve would not pay £2 per cent. The only reason why the directors did not recommend a further distribution was, that though the sum of £4681, which was the reserve of 1860, before the new Act came into force, is a sum of money entirely at your disposal, and you may use it as you please, it is thought that in a concern of this kind it is essentially necessary and prudent that we should have some little reserve to meet casualties. That is the chief reason why we ask you not to touch that sum at present till we see our way more clear to meet possible difficulties in the future.

The motion was then put and carried unanimously.

Mr. A. PELLATT: I have much pleasure in addressing the proprietors upon a subject which, in many concerns, would be considered gloomy, but which I hope in this company presents a different aspect. The remarks made by the chairman prevent the necessity for my detaining you at any length. It has been often said at meetings of railway and other companies, "Why do you not close your capital account?" To such a question here, we could give a very satisfactory answer. Our customers are continually increasing, and we find that the more we can improve the quality and enlarge the quantity of our gas, the greater becomes the demand for it. With the increase of our trade comes the necessity for an increase of capital, and therefore to-day we are about to ask you for a further contribution of £3 per share. Before the Metropolis Gas Act was passed, we had the power of declaring a less rate of dividend than we were actually making, and of employing the surplus profit in extension of our works. This we continued to do for many years, desiring to avoid the necessity of making a call upon the proprietors, as we know that in some cases—where widows, for instance, depend upon the dividends as their annuities—it is very difficult for them to meet the demand for further capital. As, however, we are now in a position to offer you 10 per cent., I have no doubt there will be no objection on your parts to the proposed call. It is now sixteen years since I first had the honour to be one of your directors. During some portion of that time, I have had to sympathize with you upon the depreciation of your property. Upon the present occasion, however, it is my pleasing task to congratulate you on having attained the highest amount of prosperity. I believe that this company can advantageously be compared with any other company in London, or in the country, with reference to its management. Allusion has been made to the officers, and I may say that we have the good fortune to be served by men of the highest probity, and of the greatest energy and zeal. I allude specially to our engineer, Mr. Innes, and to our excellent secretary, Mr. Pridden, to whose exertions, under the admirable guidance of our worthy chairman and my colleagues, it is so largely owing that we are able to face you in the manner we do this day. With reference to gas matters generally, the time appears now to have arrived when parochial discussions and objections to our proceedings have somewhat ceased. The Metropolis Gas Act has so far settled the matter between the contending parties much to our satisfaction. We have always desired it should be seen that the public interest and the interest of the proprietors were the same. They have always been so, but the public have not given us sufficient credit for it. We were, therefore, happy to find that the discussions which took place before the committee of the House of Commons brought out the fact, and showed that our interests were identical. Allow me to move—"That a call of £3 per share be, and the same is, hereby made upon the several subscribers and proprietors of this undertaking, according to their registered number of shares; and that such call be paid into the hands of the treasurer, R. Bevan, Esq., 54, Lombard Street, on or before the 21st day of October next."

Mr. GRAY: I second the motion, and I think there is no necessity for any further statement as to the propriety of making the call than what the chairman has said with regard to the bankers. I quite agree with him, that it is not wise to run a free horse to death; and I think it is perfectly clear that, with the great increase of the rental of the company, there must be a corresponding increase in the expenditure to produce it. I have no doubt the recommendation of the directors will be unanimously agreed to. It is essentially necessary for the welfare of the company to have ample means for carrying on its operations; and the mode in which the directors propose to obtain them will be acceded to by all the proprietors, as the wisest and best to be adopted.

The motion was agreed to unanimously.

Mr. BENTLEY: I think we have now a debt of gratitude to discharge, and that is, to offer our best thanks to the chairman, deputy-chairman, and board of directors, for their very able and judicious management of the company's affairs, and for the very satisfactory report they have laid before us to-day.

Mr. RHODES seconded the motion.

Mr. STEWART called attention to the remuneration paid to the directors, and expressed an opinion that, in the present prosperous condition of the company's affairs, and considering the energy and ability with which they were administered, a more liberal allowance should be made. He also passed a high eulogium upon the valuable services of the officers, and suggested that they should share in the prosperity of the undertaking, by receiving a bonus upon the amount of their salaries, as was the case in some banking companies, in proportion to the full rate of profit realized by the shareholders. He did not intend to submit a motion on the subject, but recommended it to the consideration of the board.

Mr. GRAY said, with reference to the officers he believed the suggestion of the honourable proprietor was already carried into effect. As to the remuneration to the board for their services, while he cordially concurred in the recommendation for its increase, he thought it would be irregular, and would not be agreeable to the directors, if they were to come to a resolution on the subject on the present occasion, as notice had not been given that it would be brought under the consideration of the meeting.

Mr. WHEELER said, the latter part of Mr. Stewart's proposition would be better left in the hands of the board, who were more able to form a judgment on the subject than gentlemen on this side of the table. The honourable proprietor had referred to the London and Westminster Bank, but it should be remembered that the shareholders in that undertaking were not limited to 10 per cent. dividends.

After some further conversation on the subject, a notice of motion was given to bring the question of the directors' remuneration under the consideration of the next half-yearly meeting, and the vote of thanks to the board was put and very cordially adopted.

The CHAIRMAN, in acknowledging the resolution, said: Gentlemen, on behalf of the directors and for myself, I beg to thank you sincerely for the kindness you have displayed to us, on this, as on all past occasions. I assure you it is exceedingly gratifying to us to meet a body of proprietors in a large concern like this in which so much capital is embarked, and where so much cordiality and unanimity prevails. We appreciate it exceedingly, and shall do everything in our power to deserve a continuance of your good opinion and confidence. With regard to the remuneration of the board, that is not a matter in which we should move at all. It is a question solely and entirely for the proprietors, and they must act in the matter as they think fit. If they are content to let it remain as it is, they will hear no complaint from us. I may, however, say that our remuneration is a fixed one, and has not increased with the growing prosperity of the company. Such is not the case with the officers. They have a fixed salary as a basis, but they have also a per centage in proportion to every increase of dividend paid beyond a sum beginning, I believe, at 4 per cent. Whether that is sufficient or not is a subject fairly for consideration, and I have only to say that, having reference to the very kind expression of opinion on the part of the proprietors, it is a subject which will receive the attention of the board.

The proceedings then terminated.

WOLVERHAMPTON GAS COMPANY.

The Ordinary General Meeting of the Proprietors of this Company was held at the Offices, Horsley Fields—Mr. JOSEPH WALKER in the chair.

The CHAIRMAN read the notice convening the meeting, after which, Mr. PROUD, the manager and engineer, read the following report of the directors:—

Your directors have to express their pleasure in again meeting you, to lay before you the results of the past half year.

The accounts were made up to the 30th of June, 1862. The income is £11,547. 2s. 5d.; the expenditure, £7151. 18s. 4d.—showing a balance of £4395. 4s. 1d.; this amount your directors recommend to be appropriated to a dividend at the rate of 5 per cent. for the half year, free of income-tax, payable on and after this day, leaving the sum of £287. 12s. 5d. to be placed to the reserve-fund, and £49. 3s. 8d. to be carried to the profit and loss account for the next half year.

The resolutions passed at the extraordinary general meeting on the 25th of February have been carried into effect by the conversion into consolidated capital stock of the paid-up £10 share capital of the company, and also of the newly-created shares of £1. 2s. 6d. each.

Your directors carefully and constantly attend to the preservation, in a high state of efficiency, of the apparatus and mains of the company, and, with this object, new and improved hydraulic mains, and new tar and ammonia pumps, are being erected at your Stratford Road Works.

The retirement of Mr. C. J. Elwell from the board has rendered it necessary to elect another gentleman to fill the vacancy, and your directors have unanimously chosen Mr. Charles Clark to be their colleague.

In conclusion, your directors assure you of their continued attention to the protection of the interests you commit to their care.

On the motion of the CHAIRMAN, seconded by the DEPUTY-CHAIRMAN (Mr. Joseph Cooper), the report was unanimously received and adopted.

Mr. PERRY thought that the report was most satisfactory, but, as he was a consumer as well as a shareholder, he was looking to a reduction in the price of gas as well as to a dividend. He should be glad to see another 6d. taken off.

Mr. UNDERHILL: Why, you had one last March.

Mr. PERRY: Well, but I'm always ready for another.

The DEPUTY-CHAIRMAN: At some future day.

Mr. W. SAVAGE: We can't do it at every meeting, you know.

Mr. PERRY: Oh, I don't complain; I am willing to leave it in the hands of the present directors. I only throw it out as a little hint.

The DEPUTY-CHAIRMAN: Well, when we find ourselves in a position to make a reduction, we shall be happy to make it: it always increases consumption.

Mr. UNDERHILL: Yes, we have always found that to be the case.

The subject then dropped.

A motion with reference to the dividend, arising out of the report—the only new feature being that the dividend-warrants were issued at the close of the meeting—was then put and carried; and a vote of thanks to the chairman terminated the proceedings.

COUNTY AND GENERAL GAS COMPANY (LIMITED).

The Tenth Ordinary General Meeting of Shareholders of this Company was held at the offices, King William Street, London Bridge, on Thursday, August 28—E. H. J. CRAUFURD, Esq., M.P., in the chair.

After the usual preliminaries,

The SECRETARY (Mr. R. S. Parker) read the following report from the board of directors:—

The directors beg to submit the balance-sheet and accounts for the half year ending June 30, 1862.

During the half year, 96 shares have been disposed of, producing, with calls on shares previously allotted, an addition of £940 to the paid-up capital of the company.

The expenditure on capital accounts for extension and improvements at the various works during the same period, amounts to £968. 2s. 6d.

The revenue account for the six months shows a net profit of £765. 8s. 10d., which, with the unappropriated balance of £166. 8s. 7d. brought from the previous half year, makes a total of £931. 17s. 5d.; out of this sum the directors have appropriated £20 for preliminary expenses, £10 for law expenses, and £5. 2s. 7d. for depreciation of furniture, leaving a balance of £896. 14s. 10d., sufficient to pay a dividend for the half year ending June 30, 1862, at the rate of 6 per cent. per annum, and to carry forward a surplus, unappropriated, of £47. 6s. 1d.; and the directors recommend the declaration of a dividend accordingly, to be made payable on and after the 15th of September next.

The annexed balance-sheet and profit and loss account, having been previously printed and circulated, were taken as read:—

Dr. *Balance-Sheet, to June 30, 1862.* *Cr.*

CAPITAL AND LIABILITIES.				PROPERTY AND ASSETS.			
Capital—				Property held by the company—			
Received from sundry shareholders, viz.:—				Leasehold buildings and plant at Northfleet, Pater, Pembroke, and Lea Bridge	£18,082 1 6		
£5 per share on 3807 ordinary shares	£19,035 0 0			Freehold buildings and plant at Walton, Chertsey, and Ware	14,062 12 0		
5 " 1733 preference shares						£32,144	13 6
4 " 142 " " "	9,458 0 0			Stock in trade at sundry works	£2,772 16 1		
2 " 100 " " "				Office furniture and fittings	102 10 7		
1 " 25 " " "						2,875	6 8
Total shares on register 5807		£28,493	0 0	Items of expenditure to be liquidated out of revenue by instalments, under Art. No. 71, viz.:—			
				Preliminary expenses	£1,355 13 9		
Debts and liabilities—				Law charges	189 15 2		
Debentures and loans	£1,387 3 6					1,545	8 11
Mortgages on sundry works	4,000 0 0			Debts due to the company—			
Balance of purchase-money of Ware Works, as per contract, to be paid off, by annual instalments, over a period of four years	2,100 0 0			Gas and meter rental under collection, and sundries		2,537	8 7
Tradesmen and sundries	857 1 10			Cash—			
Acceptances for goods supplied	1,140 10 6			Cash at bankers	£ 216 16 3		
Unclaimed dividends	14 4 1			Ditto in hand	4 3 5		
		9,498	19 11			220	19 8
Reserve-fund		400	0 0				
Profit and loss		931	17 5				
		£39,323	17 4			£39,323	17 4

Dr. *Profit and Loss Account.* *Cr.*

To Amount appropriated, as per directors report of the 27th of February, 1862:—				By Balance, to Dec. 31, 1861		£1,198	4 2
Reserve-fund (this sum added)	£ 150 0 0			Gas and meter rental	£3,046 8 11		
Preliminary expenses (written off)	30 0 0			Sundries and products	404 12 10		
Law charges	20 0 0					3,451	1 9
Furniture	11 8 0						
		211	8 0				
Dividend declared at meeting held on Feb. 27, 1862	£ 800 8 2						
Ditto short calculated	19 19 5						
		820	7 7				
Coals carbonized	£1,044 12 4						
Lime and purifying materials	47 17 8						
Wages and labour	533 11 4						
Retorts	47 17 7						
Rent of sundry works	139 0 0						
Local rates and taxes	97 8 8						
Commission and agency fees	109 15 10						
Miscellaneous and petty charges at works	99 15 1						
Bad debts and allowances	24 5 7						
		2,144	4 1				
Office expenses, including directors and auditors fees, rent of offices, salaries, stationery, advertising, and petty expenses		361	4 2				
Interest account		240	4 8				
		£3,717	8 6				
Balance—profit		931	17 5				
		£4,649	5 11			£4,649	5 11

Appropriation of Balance.

Preliminary expenses	£ 20 0 0		
Law charges	10 0 0		
Furniture	5 2 7		
		£35 2 7	
Dividend at 6 per cent. per annum		849 8 9	
		£884 11 4	
Surplus unappropriated		47 6 1	
		£931 17 5	

The CHAIRMAN said, it now became his pleasing duty to move—"That the report be adopted, printed, and circulated among the shareholders." The figures which had been placed before the meeting spoke so clearly for themselves, that he thought there was no necessity for him to detain them by any lengthened statement in reference to them. They would perceive at once that the progress of the company was very satisfactory. The directors were much gratified in being able to offer the shareholders the same rate of dividend on this, as on the last three occasions, and they felt themselves perfectly justified in doing so, although there was not quite so large a balance to carry forward as usual. To account for the latter circumstance, the shareholders must remember that through their generosity an additional £100 a year had been added to the expenses of the company for directors fees. They must also bear in mind that, as the works were being extended, the charges naturally increased. With regard to the last half year, however, he would draw attention to the pleasing fact that, though the rental of the company had increased, the coal account was less than for some half years past. Comparing the account for June, 1861, with the account now presented, it would be seen that in the half year ending at the former period, the sum paid for coals carbonized was £1131; while the gas and meter rental was £2784. During the last half year, the coals carbonized cost £1044: whereas the gas and meter rental was £3046. He thought that this would be considered a very satisfactory feature in the present accounts, and would be taken as an indication of the careful working of the concern. With regard to the dividend, he might also state that, while the directors were able to preserve the rate of former times, they had during the last two years, been able to write off a considerable amount The reserve-fund was now £400, and upwards of £200 had been written off for law charges and other expenses, which they were allowed to pay out of revenue, and this they had done without affecting the dividend. With these facts before the meeting, he thought the shareholders would feel themselves justified in adopting the report. There was only one other matter he would mention. The shareholders present, especially those connected with other companies, would not need to be told that it was a very common practice for consumers to complain that gas-rents were too high. The metropolitan companies had had a good deal of odium cast upon them because it was supposed they were charging too much for gas; and a hard battle had been fought to get the price reduced. This company had had some little experience in such matters; and, in one district and another, had been threatened with opposition at various times. Recently, the question had been brought forward at Chertsey; and, some few years ago, the same thing occurred at Pater, at Lea Bridge, and at Ware. The directors had been able to overcome the difficulty in the latter places; and, though the opposition had assumed a little more formidable appearance at Chertsey, he hoped they would be able to surmount this also. At present, he could tell them nothing more; time only could show what success they would have; but, he believed, they were in such a position that by the judicious conduct of the able men whose assistance they had at the board, and the practical knowledge of their officers, who carried out their duties in the

most efficient manner, they would be able, though exposed to attacks now and then, to go on smoothly and prosperously, as they had done before. With these few remarks, he would now move the adoption of the report.

Mr. W. T. Morrison seconded the motion, which was put, and carried unanimously.

Mr. W. H. Stephenson moved—"That a dividend be now declared for the half year ending the 30th of June last, at the rate of 6 per cent. per annum, on the amount of the company's share capital called up previous to that date, payable on and after the 15th of September next." He said, after the remarks of the chairman, he did not know that it was necessary for him to say much; and he would, therefore, only observe that, residing at Newcastle, and associating but seldom with the shareholders of the company, it was a matter of great satisfaction when he did come, to find that all their affairs were conducted so pleasantly and so profitably. He was glad the directors did not attempt to pay higher dividends. It was a fault with many companies that they endeavoured to please their shareholders by dividing at a high rate, which obliged them sometimes to do so out of capital. In this company, a more prudent and cautious policy was adopted, and a reserve-fund was created out of profits beyond the payment of a dividend, which, considering the present state of the money market, must be regarded as a very good interest upon the money invested by the shareholders. For himself, he felt perfectly satisfied, and should continue to be so, while he found the affairs of the company conducted as they were at present.

Mr. T. G. Payne seconded the motion, and said that, while he was perfectly content with the existing rate of dividend, he did not despair that, in a few years, they would be able to realize 10 per cent.

The motion was carried unanimously.

Mr. R. M. Christie (a director) proposed a vote of thanks to the officers of the company, of whose services he spoke in terms of high approbation, and who, he was happy to say, worked together with the utmost cordiality.

The Secretary, on the motion being adopted, expressed his obligations for the very kind manner in which his services, and those of his colleagues, had been mentioned, and assured the meeting that nothing would be wanting on their parts to deserve the confidence of the directors and shareholders.

On the motion of Mr. Williams, a vote of thanks to the chairman and directors was then passed.

The Chairman acknowledged the vote; and said that, with the able assistance of their engineer, he hoped the time would yet come, when, as Mr. Payne had predicted, the shareholders in this company would receive their 10 per cent. Whatever the rate of dividend might be in the future, they might rest assured it would be a dividend out of the profits of the undertaking. The Act of Parliament which regulated their affairs, prohibited the directors from trenching upon the capital for the purpose of making up dividends; but, even if that were not the case, they would feel, at trustees for the proprietors, that they could not be justified in such a course. He felt gratified by the expression of the approbation of the meeting, and would endeavour, with his brother directors, to prove, in the future management of the company, as they had done in the past, that their confidence was not misplaced.

RATCLIFF GAS COMPANY.

The Ordinary Half-Yearly General Meeting of the Proprietors of this Company was held on Friday, Aug. 29, at the offices of the Company, New Crane, Wapping—Samuel Foulger, Esq., in the chair.

The usual preliminaries having been complied with,

The Secretary read the following report and statement of accounts:—

The directors, in presenting their report for the half year ended June 30, 1862, have much pleasure in stating that the operations of the company have been satisfactory. During the past six months, attention was called to the dilapidated condition of the western boundary wall of the manufacturing station, and it has been deemed expedient, in pulling down the old wall, to continue and complete a wall which was commenced some time ago as a protection to the company's property. The cost of this substantial and advantageous renewal has been charged in the accounts now submitted for adoption.

The engineer reports that an ample supply of gas has been maintained throughout the district by day and night, and that the quality of the gas supplied has given general satisfaction to the consumers.

The accounts having been strictly investigated by your auditors, and certified as correct, the directors are pleased to announce, that the profits of the period over which such accounts extend, enable them to recommend that a dividend for the half year ended June 30, 1862, upon the paid-up capital of the company, after the rate of £7. 10s. per cent. per annum, or 13. 6d. per share, free of income-tax, be now declared, payable by warrant on and after the 2nd day of September next, and the directors conclude their report by congratulating the shareholders upon the increased prosperity of the company.

Dr. *Trade Account for the Six Months ending Dec.* 31, 1862. *Cr.*

To Directors allowances	£275	0	0	By Gas rental	£12,404	17	2
Salary of secretary and clerks	300	0	0	Less bad debts and allowances	264	18	1
Collectors commission and pay	171	8	0		£12,139	19	1
Rent, rates, and taxes of offices	50	0	0	Public lighting and under contracts	2,024	3	1
Stationery, printing, and general charges	237	14	3	Rental of meters	7	0	0
Payment to auditors	10	0	0	Sale of old materials	11	0	6
Coals, including carriage, &c.	6,560	17	7	Coke	2,763	3	9
Purifying materials	343	6	3	Breeze	77	15	1
Supervision and labour	2,579	9	5	Tar	374	1	3
Tools and other implements	108	0	11	Ammoniacal liquor	91	17	6
Ordinary repair and maintenance of premises	436	13	8	Miscellaneous receipts	4	18	0
Rents, rates, and taxes of manufactory	520	11	0				
Distribution—ordinary repair and maintenance	148	1	0				
Meters — restoring and replacing	17	1	6				
Meters—Additional	1	8	0				
Law and parliamentary charges	2	7	0				
Interest on borrowed capital	198	8	0				
Net profit	5,542	11	0				
	£17,493	18	3		£17,493	18	3

The Chairman, in moving the adoption of the report and accounts, observed that the report was not very lengthy, owing to the fact that nothing requiring particular mention had occurred during the past half year. The result of the operations of the company was highly satisfactory, and enabled the directors to recommend a dividend at the rate of 7½ per cent. per annum, free of income-tax, upon the increased capital of the company. That was the largest dividend ever paid by the Ratcliff Gas Company, and was encouraging not only for the present but for the future. Indeed, he was sanguine enough to hope that they would not only be able to maintain their present rate of dividend, but increase it. The report called attention to the rebuilding of the western boundary-wall of the manufacturing station; and, no doubt, the proprietors would have observed that their works now presented a much more respectable appearance. The directors were not anxious to spend money unnecessarily; but, in the present instance, the outlay was absolutely required. The work had been done in a most substantial manner; and would, doubtless, not require renewing during the lives of those present. He was happy to add that the conduct of the business of the company was such that they were free from complaint on the part of the consumers. This result was, no doubt, traceable to the energy of the engineer, who kept up the illuminating power of the gas beyond the parliamentary standard; and it was a good sign when that engineer had such confidence in the company that he had invested his savings in it, and was now a shareholder. The utmost good feeling prevailed amongst all the *employés* of the company; and the directors had given every one engaged at the works an opportunity of visiting the Great Exhibition. He would conclude by moving the adoption of the report and accounts.

Mr. Goodhart seconded the motion.

Mr. Walmisley considered the report highly satisfactory; and inquired what had been the increase of profit during the year?

The Secretary replied that it was £2600.

Mr. Walmisley considered that, with such an increase of profit, they should pay a better dividend.

The Chairman said that the matter had received the serious consideration of the board, who were not anxious to commence paying a rate of dividend which they could not see their way to maintain.

Mr. Walmisley inquired the amount of rental during the last two years?

The Secretary replied, that the rental last half year was £13,890; and, during the present half year, £14,429.

Mr. Henry Hammack said he observed that in the item of coals the company had an advantage this half year of £1300, which, of course, very materially increased the net profit. He thought the policy of the board, in not proposing a larger dividend, was a wise one, because next year they might find that they would have to pay a larger sum for coals, and the cost of distribution might be somewhat swollen in comparison with the present half year.

The Chairman remarked that it was such considerations which guided the directors.

Mr. Henry Hammack expressed his surprise that, whilst their rental had increased considerably, the cost of labour had been but slightly enhanced. He thought this proved that there had been an exercise of considerable vigilance in the conduct of the works.

The Chairman remarked that the district of the company was somewhat circumscribed, and he believed that they would increase their rental without a corresponding increase in the cost of labour.

Mr. Nutter expressed his approval of the policy of the directors in not proposing a larger dividend at the present time.

The resolution for the adoption of the report and accounts then passed unanimously.

Mr. Taylor proposed the payment of a dividend for the half year at the rate of 7½ per cent. per annum, or 13s. 6d. per share, free of income-tax.

Mr. Walmisley seconded the motion, which passed *nem. dis.*

Mr. Johnson moved a vote of thanks to the directors for the able manner in which they had conducted the company's affairs during the past half year.

Mr. Nutter seconded the motion, which was unanimously carried, and suitably acknowledged by the chairman on behalf of himself and his colleagues.

On the motion of Mr. Henry Hammack, seconded by Mr. Wilkinson, thanks were voted to the auditors.

Mr. Taylor and Mr. Fairclough, the auditors, responded.

On the motion of Mr. Nutter, seconded by Mr. Johnson, and supported by the Chairman, a cordial vote of thanks was passed to the secretary for his assiduity and attention to the business of the company.

Mr. H. J. Baddeley, in responding, said, he felt that he had the confidence of the directors; this incited him to exert himself to promote the prosperity of the company; and he trusted he should ever merit the confidence which he at present enjoyed.

On the motion of Mr. Henry Hammack, seconded by Mr. Taylor, thanks were unanimously voted to Mr. Wilton, the engineer.

Mr. Wilton briefly responded.

Mr. Johnson then gave notice that, at the next half-yearly meeting, he should move that the directors receive an increased amount of remuneration.

The usual ovation to the chairman closed the proceedings.

NEW RESEARCHES ON THE FORMATION OF HYDROCARBONS,

By M. Berthelot.

[From the *Comptes Rendus de l'Académie des Sciences.*]

In the researches which I have published during the last five years, I have established the synthetical formation from their elements of the simple hydrocarbons and of the alcohols

I have described sure methods of effecting these transformations. However, the simplicity of the results appearing to leave something to be desired, I have undertaken fresh researches, in order better to render evident the regular chain of transformation. Let me first recall to mind a few of the facts already established, so as to mark the progressive operations.

1. Carbon and oxygen unite to form oxide of carbon; hydrogen and oxygen unite to form water:—

$$C_2 + O_2 = C_2O_2; \quad H_2 + O_2 = H_2O_2.$$

2. Oxide of carbon and water unite to form formic acid:—

$$C_2O_2 + H_2O_2 = C_2H_2O_4.$$

3. Formic acid (in the state of formiate of baryta) changes into marsh gas, water, and carbonic acid, according to a simple equation analogous to that by which acetic acid changes into acetone:—

$$4C_2H_2O_4 = C_2H_4 + 2H_2O_2 + 3C_2O_4.$$

It is here that my new researches commence.

4. Pure marsh gas submitted to the action of heat, or, better, to the sparkof a powerful induction-coil, undergoes a remarkable metamorphosis. Whilst a certain amount splits up into its elements, another very considerable portion condenses into a more complicated hydrocarbon acetylene:—

$$2C_2H_4 = C_4H_2 + H_6.$$

Marsh Gas. Acetylene.

Nothing is easier than to obtain in this manner large quantities of acety-

lene in the state of purity by reproducing it from the cupreous acetylide formed from the crude product of the reaction.

To render these results more decisive in what relates to the formation of acetylene from its elements, I have reproduced it with marsh gas obtained from formic acid, that is to say, from water and oxide of carbon. This marsh gas, previously washed with bromine and potash, furnishes, indeed, acetylene, a result easy to foresee, but which I think it necessary to verify as a counterproof to my first experiments.

5. The acetylene thus obtained becomes a starting point for new formations. Indeed, I have previously shown that nothing is easier than to change it at the ordinary temperature into olefiant gas:—

$$C_4H_2 + H_2 = C_4H_4.$$

Acetylene. Olefiant gas.

This is one of the neatest examples of the fixation of hydrogen in an organic substance. It is effected by attacking zinc by ammoniacal water in the presence of acetylide of copper. Here are some new details on the analysis of the products of this reaction. These products consist of hydrogen and olefiant gas, mixed with a little acetylene which has escaped metamorphosis. The method of analysis, which I am about to point out, is essentially qualitative. It admits of isolating in a manner each of the elements of a gaseous mixture; and the process is the more useful to be known, inasmuch as a similar analysis appears to have recently given rise to rather serious errors. The gaseous mixture is treated with ammoniacal protochloride of copper, which dissolves *simultaneously* the hydrocarbons $C_{2n}H_{2n-2}$, such as acetylene, and the hydrocarbons $C_{2n}H_{2n}$, such as olefiant gas; but the acetylene forms an insoluble combination, which is not destroyed by the ebullition of the liquid—a double property, which admits of its separation; whilst the olefiant gas simply enters into solution, and may be disengaged in the state of purity on boiling the liquid. It is thus obtained isolated, and may be washed with dilute sulphuric acid to free it from ammoniacal vapours, and then submitted to eudiometrical analysis.

6. Olefiant gas, C_4H_4, formed from acetylene, C_4H_2, may in its turn be surhydrogenized and transformed into acetene, C_4H_6:—

$$C_4H_4 + H_2 = C_4H_6.$$

Olefiant gas. Acetene.

This is effected by a general method, which I published five years ago, and which has since received more than one application. It consists in fixing bromine on the first hydrocarbon, so as to form a bromide $C_4H_4Br_2$; then, in replacing the bromine by hydrogen. This inverse substitution takes place very readily by the employment of iodide of potassium and water, without other agents.

I think it will be as well to mention here, that this fact, and the reduction of glycerine by iodide of phosphorus, constitute the first examples of the use oi iodized compounds compounds as reducing agents. We know how fruitful this method has become of late years. Among the other results that I have succeeded in realizing, I will only mention one to conclude this account. It is,

The complete deoxidation of glycerine $C_6H_8O_6$

And its transformation into the carbide C_6H_6.

But let us return to the progressive construction of hydrocarbons.

7. Marsh gas, acting upon oxide of carbon, forms propylene, conformably to the following reaction, which I have already noticed:—

$$2C_2H_4 + C_2O_2 = C_6H_6 + H_2O_2.$$

Marsh gas. Propylene.

8. The same marsh gas, sealed in a Bohemian glass tube, then heated to a temperature at which the glass begins to soften, gives rise to a small quantity of naphthaline. The greater portion resists. The formation of naphthaline from marsh gas may be represented by the following equation:—

$$10C_2H_4 = C_{20}H_8 + H_{32}.$$

It recalls the formation of chloride of Julin, $C_{20}Cl_{10}$, from perchloride of carbon, C_2Cl_4.

To resume, we can form

From their elements, oxide of carbon and water;

From these latter formic acid;

From formic acid, marsh gas . . . . . C_2H_4;

From marsh gas, acetylene . . . . . C_4H_2;

And, consecutively, olefiant gas . . . . . C_4H_4;

And acetene . . . . . C_4H_6;

From marsh gas and oxide of carbon, propylene . . . C_6H_6;

And, finally, from marsh gas, naphthaline . . . . . $C_{20}H_8$.

All these formations result from a regular series of simple reactions, exerted at first on the elements, then on the hydrocarbons. They establish the gradual and direct generation of hydrocarbons of more and more complexity from more simple carbides.

Parallel to this method, founded on the progressive condensation of the hydrocarburetted molecule, I may mention the method of simultaneous condensations, the applications of which I have otherwise developed. In the dry distillation of formiates, acetates, and analogous bodies, one and the same hydrocarbon molecule, C_2H_2, separates simultaneously in several different states of condensation; such as

Olefiant gas	$(C_2H_2)^2$
Propylene	$(C_2H_2)^3$
Butylene	$(C_2H_2)^4$
Amylene	$(C_2H_2)^5$

The constitution of the principal of these hydrocarbons has been verified by the formation of the corresponding alcohols.*

Such are at present the only methods established by experiment which allow of starting from their elements to arrive at carbides, at first simple, then more and more complex. Other analogous processes will undoubtedly be discovered, for such is the course of experimental science; but I think that the progress which may be made in this direction will be based upon the same general principles. Indeed, the two great paths of synthesis in organic chemistry are progressive condensation or simultaneous condensation, either at the expense of the elements of a single compound, or at the expense of the joint elements of two compounds. On these two principles depend all the general methods already found out experimentally, and of which more are being discovered every day. Now that synthesis has overcome the first and greatest obstacles—I mean those which hindered the formation of hydrocarbons and alcohols from their elements—the path widens as we advance; the compounds formed from these first terms become more numerous and undergo more varied and delicate metamorphoses. As is the case in other progressive sciences, the resources increase at each new step, whilst chemists become familiar with a series of problems of which they were hitherto almost entirely ignorant.

* It is also known to how many proofs the carbides, obtained in the dry distillation of the acids $C_{2n}H_{2n}O_4$, and analogous bodies have been submitted by the experiments of MM. Reynolds, Hofmann, Cahours, Wurtz, &c. (The preparation of numerous chlorine and bromine derivatives, formation of glycols, &c.)

Preparation of Alcohol from Coal-Gas.—The daily and weekly press, whose scientific paragraphs at this season of the year are more calculated to astonish than instruct the public, have lately contained announcements of a discovery to the above effect, at St. Quentin, by a young chemist named Cotelle. The paragraph goes on to state that a joint-stock company, with a capital of 400,000f., has been formed to carry out the patent. The inventor announces that he can sell his alcohol at 25 francs the hectolitre, while the most inferior spirit produced from other articles is selling for 75 francs the hectolitre. This, like many other chemical patents, is utterly impracticable on the large scale. M. Cotelle has read that M. Berthelot, some years ago, succeeded in transforming olefiant gas into alcohol by the intervention of sulphuric acid, and has jumped to the conclusion that, as coal-gas contains a considerable quantity of olefiant gas, he has only to shake it up with sulphuric acid to produce as much alcohol as he likes. We have seen M. Cotelle's patent; in it he claims to produce alcohol of good flavour by means of purified lighting gas passing over (*traversant*) liquid sulphuric acid, or by bringing it in contact with the acid in vapour (*avec l'acide en vapeur*). Our readers who know the long and tedious operation by which even a minute trace of alcohol can be produced in this way, will not envy the shareholders who have subscribed with such wonderful rapidity.—*Chemical News.*

Dissolution of the Dover Consumers Gas Company.—An attempt was made in 1860 to establish a consumers gas company in Dover; but the project failed at the outset, principally in consequence of a non-compliance with the standing orders of Parliament, in the indication of the site upon which it was intended to erect the proposed works. A deposit of £1 per share was paid on 753 shares, out of which the expenses absorbed 18s. 3d. per share; and the balance of 1s. 9d. has just been returned to those who paid the deposit. The holders of 370 shares (including three directors) refused, however, to pay the deposit, and have been permitted to escape, without contributing anything towards the expenses.

A Naphthometer.—At the June meeting of the Franklin Institute of Philadelphia, Mr. Howson exhibited a patent naphthometer, or benzine detector. It was the invention of Messrs. H. J. Smith and Woodruff Jones, of that city. The instrument consists of a reservoir, with a tightly-fitting cover, from the top of which projects a tube, surrounding a wick tube. A thermometer also passes through the cover, and occupies such a position that its bulb comes within a short distance from the bottom of the reservoir. In order to determine the temperature at which the oil gives off sufficient vapour to cause an explosion, the oil to be tested is poured into the reservoir, the wick is lighted, and the instrument placed on a stove, or over the flame of the lamp. At a temperature which varies in proportion to the quantity of explosive ingredients contained in the oil, the vapour is given off, and, mixing with the air in the reservoir, passes up through the space between the wick tube and the larger tube, and explodes when ignited by the flame, thereby extinguishing the light. The height of the mercury in the thermometer will determine the quality of the oil. The contrivance is very simple and cheap, and enables any one to ascertain in a few minutes whether an oil is of a quality to be burned with safety.

Bronzing.—This art consists in communicating to various articles, in metal, wood, and plaster, the appearance of bronze. Antique bronze possesses a peculiar greenish colour, which is due to oxide formed on bronze figures which have been exposed for a long period to the action of the atmosphere. A green bronze liquid, to imitate the antique, may be made with two parts of verdigris and one part of sal ammoniac, dissolved in vinegar, then boiled for fifteen minutes, filtered through paper, and diluted with water. Articles of metal to be bronzed, are immersed in this liquid, until they acquire the peculiar green tinge desired, after which, they should be carefully washed, and dried in sawdust. Copper bronze powder is prepared as follows:—Strips of copper are dissolved in nitric acid, in a glass vessel, and then strips of iron are added to the acid, when the dissolved copper is precipitated to the bottom of the vessel, in the form of a very fine powder. This powder is then washed with water, and dried, and may be used for bronzing. Another bronze powder, called *aurum mosaicum*, is prepared as follows:—One pound of tin is first melted in a crucible, and then poured cautiously into half a pound of mercury contained in an iron dish. When cold, it is reduced to powder, and mixed with 7 ounces of flower of sulphur, and half a pound of sal ammoniac, and triturated in a mortar. The mass is then calcined in a flask, when the sulphur, mercury, and ammonia, are expelled, leaving the tin in the form and colour of a bright flaky gold powder. This is the basis of many bronze powders. It may be converted into a reddish bronze powder by grinding some red lead among it; or into a greenish bronze by grinding some dry verdigris with it. Bronze powders are put on with a size, made by boiling about 4 ounces of gum animi to every pound of pure linseed-oil, in a flask, until it becomes the thickness of cream, after which, it is diluted with turpentine, for working with the brush. The article to be bronzed is first covered with some of this size; and, when nearly dry, a piece of soft leather is wrapped round the finger, dipped into the powder, and rubbed gently over the article. The powder may also be rubbed on with a camel's hair pencil, and then left to dry thoroughly; after which, all the loose powder is brushed off. Bronze may also be applied in the moist state by mixing the bronze powder with a strong solution of isinglass, and applying it with a brush, like a varnish. Wood is bronzed by first coating it with several coats of strong size, made of the skins of animals, such as the parings of parchment. Prussian blue, raw umber, and yellow ochre, or pipe-clay, are usually mixed with the size, to give it what is called body. Two coats of the size, one dried before the other is put on, are generally applied to wood; and, before the last coat is fully dry, the bronze in powder is applied with a fine brush, and allowed to dry perfectly; after which, it is rubbed with a woollen cloth. For articles exposed to the atmosphere, the linseed-oil size is the only one which must be employed. A mixture of any of the common dry paints, blue, yellow, or red, with *aurum mosaicum*, will produce any desired colour. Bronze powders, mostly manufactured in Germany, are imported in considerable quantities, and may be obiained wherever artists materials are sold. They can be applied to bronze, metallic, or plaster articles, in any of the modes prescribed.

Cement for Pipes.—Take 6 lbs. of plumbago, 3 lbs. of fine chalk, 8 lbs. of the sulphate of baryta, and 3 lbs. of linseed-oil, and boil them together for half an hour. The black lead, chalk, and baryta, must be reduced to a very fine powder, and well mixed with the oil. A cement is thus obtained which may be employed with great advantage in luting the joints of steam-boilers, water-pipes, gas-pipes, &c.

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BILSTON STREET WORKS,
WOLVERHAMPTON.
Manufacturers of Gas-Fittings of every description, Lamps and Chandeliers, Star and Sun-Lights, and Mediæval and other Church-Fittings to any design.

S. CARPENTER, Manufacturer of Stokers Gloves, at 11s. per dozen; all kinds of Chamois Leather for Cleansing Lamps, and Leather for Governors and Exhauster-Valves.
3, Bow Common Lane, London.

ROBERT MACLAREN and CO.,
EGLINTON FOUNDRY, GLASGOW,
Manufacturers of all sizes of Cast-Iron Main Pipes, by an improved Patent. General Ironfounders, Gas Engineers, and Wrought-Iron Tube Makers.

SAMUEL CUTLER, Gasholder
MAKER and CONTRACTOR
For Tanks, Roofs, Purifiers, Condensers, Erection and Alteration of Works and every description of Gas Apparatus.
Providence Iron Works,
MILL WALL, POPLAR, LONDON, E.
Main Laying and Gas-Works erected complete.

HARRIS and PEARSON,
PROPRIETORS OF
BEST CLASS-HOUSE POT AND CRUCIBLE CLAY.
MANUFACTURERS OF
FIRE BRICKS, GAS RETORTS, &C.
Amblecote Fire Clay and Brick Works,
STOURBRIDGE.
Late in the occupation of I. and W. King.
Originally J. Pidcock, Esq.
NB. A quantity of best Clay Retorts in stock, viz.—Circulars, 14 inches, 15 inches, 16 inches.
D's, 16×12, 15×14, 20×16, 16×18.

International Exhibition,
July 11, 1862.
Class X., No. 2259.

The Jurors have AWARDED A MEDAL to
JOSEPH CLIFF and SON,
Wortley, nr. Leeds,
For Excellence of Material and Manufacture of
FIRE-CLAY RETORTS FOR GAS.

International Exhibition,
July 11, 1862.
Class XXXV., No. 6841.

JOSEPH CLIFF and SON,
Wortley, nr. Leeds,
Are Awarded Honourable Mention for
STONEWARE DRAIN-PIPES
OF LARGE DIAMETER.

GEORGE CUTLER & CO.,
GAS ENGINEERS, &c.,
London Gasholder and Boiler Works,
8, WHARF, WENLOCK ROAD, CITY ROAD, N.,
LONDON.

Rye, Nov. 12, 1860.

Dear Sirs,—I consider it incumbent on me to acquaint you that the alterations recently made on the Rye Gas-Works—viz., the addition of a NEWLY-IMPROVED WASHER, and other work for the Purification of Gas, executed by the experienced workmen under your able supervision—are perfectly satisfactory to the Company, and the Gas is now as pure as it can be made.

I am, dear Sirs, your obedient servant,
CHARLES THOMAS, Superintendent,
Rye Gas-Works.

Messrs. Cutler and Co.

JOHN ROGERSON and CO.,
NEWCASTLE-ON-TYNE & MIDDLESBRO'-ON-TEES.

Wrought and Cast Iron Pipes, Cast-Iron Retorts, and all kinds of Foundry Work necessary for Gas-Works. Fire-Bricks and Clay Retorts. Gas Coals of every description. Pig, Bar, and Plate Iron.

LONDON HOUSE:
12, ROYAL EXCHANGE BUILDINGS.

WHITEHOUSE and CO., Boiler and GASHOLDER MAKERS,
GLOBE PATENT TUBE WORKS,
WEDNESBURY,

Beg to draw the attention of Engineers and Managers of Gas Works to the superior quality of the Article they manufacture, both in respect of the iron employed, and the perfect manner in which it is welded; in proof of which they can refer to the testimonials of the most eminent Gas Engineers, and the experience of the principal of the large Gas Companies of the kingdom.

Orders promptly executed.

TO INVENTORS AND PATENTEES.

MR. W. H. BENNETT, having had considerable experience in matters connected with Gas, Water, and Sanitary Improvement, begs to say that he continues to assist Inventors in the perfection of their designs, and to obtain for them PROVISIONAL PROTECTION, whereby their invention may be secured for Six Months; or LETTERS PATENT, which are granted for Fourteen Years.

Patents completed, or proceeded with at any stage, thereby rendering it unnecessary for persons resident in the country to visit London.

Patents procured for Foreign Countries.

Information as to cost, &c., supplied gratuitously upon application to the advertiser, 42, Parliament Street, WESTMINSTER. [Office of the JOURNAL OF GAS LIGHTING, &c.]

WALTER MABON, Engineer,
ARDWICK IRON WORKS, FAIRFIELD STREET,
MANCHESTER,
Manufacturer of
IRON TANKS for Gasholders, Railway Stations, &c.

GASHOLDERS.—Extensive premises at Gorton, solely for the manufacture of Gasholders, and other heavy Wrought-Iron Structures.

GAS APPARATUS.—W. M. has an extensive assortment of patterns for Purifiers from 4 feet to 15 feet square, also round ones from 4 feet to 10 feet diameter; Scrubbers, Condensers, Washers, Columns, Girders, and Tripod Patterns, suitable for Gasholders, from 10 feet to 150 feet diameter, either Single-lift or Telescope. Contracts for Gas-Works of any Magnitude. Designs, Specifications, and Estimates furnished.

WROUGHT and CAST IRON ROOFS for Railway Stations, Gas Works, Warehouses, and Sheds, prepared for Slates or for Corrugated Iron.

IRON HOUSES, either for Dwellings, Manufactories, or Public Buildings.

PIPES and VALVES, for Gas and Water, from 2 inches to 48 inches bore.

GAS ENGINEERING OFFICES,
16, ADAM STREET, ADELPHI, W.C.
(Close to the Society of Arts.)

Mr. ANDERSON continues to Erect, or to supply the Drawings for his PATENT RETORT-SETTINGS. On this principle, three Ovens of Retorts are heated by one Coke and one Tar fire; and, for small Works, the principle is adapted to single Ovens in both cases, with a total absence of smoke, while the duration of the Retorts is from two to three years, and with great economy of fuel.

Mr. ANDERSON continues to supply his PATENT GAS-EXHAUSTER, together with Steam-Engines, &c., erected complete.

This is the most simple machine of the kind in use, being merely a double-action Pump, which any one can comprehend, and works for years without any repair.

Also, his PATENT FOUR-WAY VALVES. One of these valves does the work of three ordinary valves, when applied to Purifiers, Station-Meters, or other Gas Apparatus.

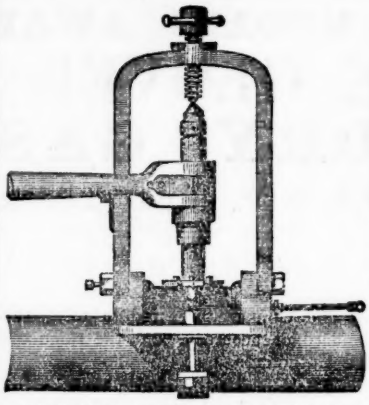
A workman cannot, by any possibility, make the mistake of shutting one passage without opening another; thus ensuring a constant flow of the gas.

All Racks, Pinions, Springs, and other delicate parts of ordinary valves, are in these valves abolished; the Connecting-pipes are also much simplified, and the cost reduced fully 30 per cent.

Also, his CONCENTRIC GOVERNOR, which stands in half the space of the ordinary Governor, and regulates the flow of Gas to the greatest nicety.

Mr. ANDERSON having five Gas-works on lease, besides being engineer to several others, has constant opportunities of perfecting his inventions before they are brought under public notice.

SIMMONS'S
PATENT GAS AND WATER CONNECTOR.



This Machine is invaluable to Gas and Water Companies, Gas-Fitters, &c., being the only Connector whereby accidents can be prevented. It is simple in construction, economical in saving the escape of Gas, and can be worked by a labourer.

No. 1 size, to suit ¾ and ½ in. Services, £6. 6s. each.
" 2 " " ¾ and 1 " " £8. 8s. "
" 3 " " 1¼, 1½, & 2 in. " £12. 12s. "
Including Rachet Brace, Drills, Taps, &c., complete.

MANUFACTURER,
J. COWDY,
BOND COURT, WALBROOK,
LONDON.

Connectors made for fixing on the ends of Mains, to prevent escape in course of laying.

BIRTLEY IRON WORKS,
CHESTER-LE-STREET,
DURHAM.

Manufactory for every description of Casting and Machinery for Gas Works and Water Works.

Warehouse in London for Cast-iron Pipes and Connections of all sizes and in any quantity, Scott's Wharf, Bankside, Southwark.

Office in London, Mr. E. M. PERKINS, 78, Lombard Street.

JAMES NEWTON & SONS,
(Established 1820,)
FIRE-BRICK AND TILE MERCHANTS,
Wholesale and for Exportation,
FALCON DOCK, 78 AND 79, BANKSIDE,
SOUTHWARK, LONDON, S.E.,
DEPÔT for STOURBRIDGE AND NEWCASTLE FIRE-BRICKS, LUMPS, TILES, and FIRE-CLAY, and every Article suitable for
GAS AND WATER WORKS.

DUPLEX GOVERNOR, for Gas-EXHAUSTER ENGINES.
D. LANE'S PATENT.

This Governor combines great delicacy with remarkable certainty of action. A pressure of one-tenth of an inch of water, operating on a diaphragm of 3 inches diameter, is sufficient to work the Regulating-Valve of an Engine of any power.

TESTIMONIALS.

Borough Engineer's Office, Town Hall
Halifax, March 29, 1862.

Dear Sir,—I have much pleasure in bearing my testimony to the efficiency of your Duplex Governor for regulating the speed of Gas-Exhausters.

The Governor has been perfectly self-acting, and has never given us one moment's thought, trouble, or expense. The engine-man has only to weight the tappets to the required vacuum, and the pressure-register paper never shows a greater variation than three-tenths in the twenty-four hours.

I can very confidently recommend the adoption of it to engineers and managers of gas-works making 50 million feet a year and upwards.

I am, dear Sir, yours faithfully,
G. W. STEVENSON.

Denny Lane, Esq., Cork Gas-Works,
Ireland.

Gas-Works, Cork, April 4, 1862.

Dear Sir,—Having for some time past had in use three of your newly-invented Regulators for governing the speed of Steam-Engines in connexion with Gas-Exhausters, I am glad that I am able to speak of this valuable machine in terms of the highest praise. I have had them applied, as you know, to high-pressure and condensing engines, with Beale's and also Anderson's Exhausters. In every case, this small and valuable instrument is thoroughly effective in regulating the speed of the Exhauster. No amount of care with the hand can equal its accuracy of action for the intended purpose.

Denny Lane, Esq. A. H. STILL, C.E.

An Illustrated Circular, explaining the operation of the Governor, can be obtained by application to D. LANE, 72, South Mall, CORK; and the Governor can be seen in London at the Offices of GEO. ANDERSON, Esq., C.E., 16, Adam Street, ADELPHI.

JAMES OAKES and CO.,
ALFRETON IRON WORKS, DERBYSHIRE,
AND
WENLOCK IRON WHARF, 20, WHARF ROAD,
CITY ROAD, LONDON,

Beg to inform Gas and Water Companies and the public, that they keep in stock in London all the CASTINGS in general use in Gas and Water Works, including Iron Retorts, Socket and Flange Pipes, Bends, Branches, and Syphons of all sizes, Lamp Columns, &c., &c.

N.B.—Orders for Cast-iron Tanks, Girders, Columns, Cylinders, and all irregular castings, will have immediate attention.

CHARLES HORSLEY, Agent.

HENRY BALFOUR AND CO.,
ENGINEERS & IRONFOUNDERS.
DURIE FOUNDRY,
LEVEN, FIFE;
& 16, ADAM STREET, ADELPHI, LONDON, W.C.

Gas Engineers and Contractors for Gas and Water-Works; manufacturers of Steam Engines and Exhausters, Steam Boilers, Gasholders, Cast-Iron Tanks, Purifiers, Condensers, Iron Retorts, Gas and Water Pipes.

Plans, Specifications, and Estimate furnished for new, or for extensions and alterations on existing, Works.

ALFRED PENNY, Gas and CONSULTING ENGINEER,
WENLOCK IRON WORKS,
21 & 22, WHARF ROAD, CITY ROAD, LONDON.

Mr. PENNY having had a large experience in the construction, alteration, and management of Gas-Works, begs to inform the Directors of Gas Companies that he may be consulted on all matters appertaining thereto. He also manufactures Gasholders, Purifiers, and all the various apparatus used in Gas-Works, and keeps in stock Retorts and Mouthpieces, Socket-Pipes, Bends, Branches, T-pieces, &c. &c.

Plans, Specifications, and Estimates prepared.

INTERNATIONAL EXHIBITION,
1862. CLASS X.
PRIZE MEDAL
For excellence of Fire-Clay Gas Retorts, and
"HONOURABLE MENTION" for
good quality of Fire-Bricks.

WILLIAM STEPHENSON & SONS,
THROCKLEY,
NEWCASTLE-ON-TYNE,
MANUFACTURERS OF EVERY DESCRIPTION OF
FIRE-BRICKS, CLAY RETORTS
&c. &c.
RETORT MOUTHPIECES, BOLTS, NUTS, &c.

GEORGE BOWER,
GAS ENGINEER, MANUFACTURER,
AND CONTRACTOR,
ST. NEOT'S, HUNTS.

References to between 100 and 200 Gas-Works Designed and Erected by the Advertiser.

LESLIE'S PATENTS: Gas and Coke from common Coal, greatly increased in value.—60, Conduit Street, LONDON, W.

LESLIE'S PATENTS: Up to Forty Candle Gas.—60, Conduit Street, LONDON, W.

LESLIE'S PATENTS: Licenses for England, Scotland, and Ireland, the 86 Departments of France and Belgium.—60, Conduit Street, LONDON, W.

LESLIE'S PATENTS: The National Waste Heaps at Collieries UTILIZED for Gas purposes.—60, Conduit Street, LONDON, W.

STOURBRIDGE FIRE-CLAY WORKS.
E. BAKER and CO.
(Contractors to Government).
24 WHARF, HARROW ROAD, PADDINGTON, W.

Every article manufactured at their own Works and Mines, Brierley Hill.

FIRE-BRICKS, Lumps, Squares, Tiles, and Gas Retorts of all dimensions.
CRUCIBLE and CEMENT CLAYS.
GARDEN EDGINGS, of various patterns.
BUFF and ORNAMENTAL TILES.
CLINKERS and STABLE PAVINGS, noted for hardness and durability, being perfectly non-absorbent.

Shipments on the shortest notice.

BEVERLEY'S Patent Equitable GAS-METER,
From which the Water cannot be abstracted.

JOHN BEVERLEY & SON,
GAS-METER MANUFACTURERS, &c.,
LEEDS, YORKSHIRE,

Are prepared to supply the above Meters, either stamped or otherwise, and to adapt their patented principle to any old Meters that may be sent to them to be repaired, tested, and stamped.

Manufactory, No. 9, Mark Lane, LEEDS.

R. LAIDLAW & SON,

GAS ENGINEERS, IRON & BRASS FOUNDERS,

Alliance Foundry, 147, East Milton Street, and Barrowfield Iron-Works,

GLASGOW;

AND AT SIMON SQUARE, EDINBURGH;

MANUFACTURERS OF

STATION & CONSUMERS METERS, ALL SIZES;

WROUGHT-IRON TUBES, FOR GAS, WATER, & STEAM; CAST-IRON RETORTS & PIPES;

HYDRAULIC MAINS, CONDENSERS, WASHERS, SCRUBBERS, PURIFIERS, & TANKS,

GASHOLDERS;

GOVERNORS, SLIDE-VALVES, &c.;

WROUGHT & CAST IRON ROOFS & HOUSES.

Contractors for Gas-Works of any Magnitude. *Plans, Specifications, and Estimates furnished.*

SOLE AGENT FOR THE SOUTH, SOUTH-EAST, AND SOUTH-WEST OF ENGLAND:—

J. E. DOWSON, 38, DOWGATE HILL, THAMES STREET, LONDON, E.C.

TRUSS'S PATENT ELASTIC PIPE-JOINT,

FOR GAS AND WATER-MAINS, AND STEAM PIPING,

Is the only PERFECT joint that has ever been constructed, and supplies the long-felt desideratum, by allowing for the expansion and contraction of metals, and for oscillation and deflection, without impairing the joint. Gas Companies will effect an incalculable saving in adopting it, as compared with the present imperfect mode of jointing.

Drawings, Estimates, and every particular, furnished on application to

THOMAS SEAVILLE TRUSS, C.E., 53, GRACECHURCH STREET, LONDON, E.C.

LLOYD AND LLOYD

ALBION TUBE-WORKS, BIRMINGHAM,

MANUFACTURERS OF

WROUGHT-IRON TUBES & FITTINGS,

PLAIN, GALVANIZED, & ENAMELLED, for Gas, Steam, and Water, from ⅛ in. to 6 in. bore.

STOCKS TAPS, and DIES, GUN METAL GLAND-COCKS, WATER-GAUGES, &c.;

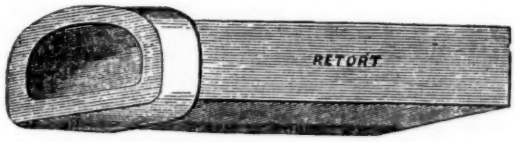
PATENT LAP-WELDED IRON TUBES,

For Locomotive and Marine Boilers, &c.

LONDON WAREHOUSE—No 66, QUEEN STREET, E.C.

KING BROTHERS,

STOURBRIDGE FIRE-BRICK AND RETORT WORKS.



KING BROTHERS beg especially to call the attention of Gas Companies to the superiority of their Retorts, which are made from the celebrated STOURBRIDGE FIRE-CLAY. Mr. King has patented a Kiln for burning Retorts, by which Patent all Cold Air is excluded from the Kiln while burning, thus rendering them FREE FROM CRACKS AND CORRECT IN FORM. By great care in Manufacturing, combined with the advantages in burning, a VERY SMOOTH SURFACE is obtained, rendering them less liable to carbonize.

Retort Ovens, Fire-Bricks, Guards, Saddles, Rabbitted Burs, Flues, and Quarries, are all Manufactured of the same quality of Clay.

Every Retort and Brick is branded "King Brothers, Stourbridge."

FIRE-CLAY GAS RETORTS.

ESTABLISHED IN 1795.

JOSEPH CLIFF and SON,

WORTLEY FIRE-BRICK WORKS, near LEEDS,

Are Awarded the PRIZE MEDAL for Excellence of Material and Manufacture of Clay Retorts, July 11, 1862.

Class X., No. 2259.

THESE RETORTS are unrivalled in excellence, being the BEST FINISHED INTERNALLY, and THE MOST CORRECT IN FORM, of any in the Kingdom. From the peculiar composition used in working up the face of the material, they are rendered unusually smooth, close, and FREE FROM SURFACE CRACKS, thus, in a great measure, preventing leakage and the adhesion of carbon to their interior surface.

To meet the yearly increasing demand of UPWARDS OF THIRTY SEASONS and to carry out the late improvements in the manufacture, the Premises have been re-erected and much enlarged, and Engineers may rely WITH CONFIDENCE on their orders being completed with a greater regard to despatch than by any other House.

THE WORKS ARE WELL SITUATED

For EXPORT from the Ports of LONDON, LIVERPOOL, HULL, MIDDLESBRO', HARTLEPOOL, and STOCKTON.

FIRE-BRICKS, LUMPS, GUARDS, TILES, AND CLAY OF THE SAME QUALITY.

M. P. NEWTON, London Agent, No. 4, Wharf, King's Cross Goods Station.

WILLIAM RICHARDS,

SOLE INVENTOR AND FIRST MANUFACTURER

OF THE

DRY GAS-METER,

Which obtained Prizes at the Exhibitions of London, 1851; New York, 1853; Paris, 1855; and three Prizes at the present Exhibition of 1862.

CRAWFORD PASSAGE, COPPICE ROW, CLERKENWELL, LONDON.

W. RICHARDS invites the attention of Gas Companies and Engineers to the Dry Meter manufactured by him, as possessing advantages over others, by his method of disposing of the flexible material, so that collapsing or bagging of the same is avoided. This defect, so conspicuous in some of the meters of other makers shown at the Exhibition, causes the measurement of the instrument to vary under different circumstances, and the durability of the same is materially impaired.

In the meters manufactured by W. Richards, all the metals of the working parts are incorrodible; the flexible material, the best that can be employed; and, in general construction, they are not to be surpassed.

To those who prefer the Wet Meter, W. Richards submits his patented improvements in the same, which consist in contracting the measuring-wheel at, and near, the water-line—thus allowing of a longer range for the float, and avoiding the sudden extinctions now so common; also, a simple remedy is applied to prevent fraudulent consumption, which the operation of the Sales of Gas Act has so much facilitated.

TELL-TALE EXHAUST AND PRESSURE-INDICATORS;

GOVERNORS, STATION-METERS, &c.

WILLIAM INGHAM AND SONS,

WORTLEY FIRE-BRICK AND RETORT WORKS,

Near

Leeds.

W. INGHAM and SONS, having for many years been extensively engaged in the Manufacture of

RETORTS AND FIRE-BRICKS FROM THE CELEBRATED WORTLEY FIRE-CLAY,

beg to call especial attention to their RETORTS, which have for many seasons proved to be unsurpassed in quality by any in the Kingdom, their FREEDOM FROM CRACKS and the ADHESION OF CARBON rendering them worthy the attention of all parties interested in the making of Gas.

The Works are of such magnitude as to ensure the prompt execution of orders to any extent.

Estimates for Setting, or Bricklayers sent when required.

GAS OVENS IN SEGMENTS OF EQUAL QUALITY.

A large stock of Fire-Bricks, Fire-Clay, Terra Cotta, and Drain-Pipes of all sizes kept in London at CHRISTIE & CO.—Wharf, 64, Bankside, Southwark, where all particulars of Prices, &c., may be obtained.

N.B.—*Export orders continue to have prompt attention.*

WILLIAM SUGG,

MANUFACTURER OF

PATENT DRY AND WATER GAS-METERS, TEST GASHOLDERS, AND APPARATUS,

"EVANS'S" PHOTOMETERS,

Experimental Meters, Minute Clocks, &c., Station-Meters and Governors,

STREET-LAMP GOVERNORS AND LAVA BURNERS,

19 and 20, MARSHAM STREET, WESTMINSTER.

INTERNATIONAL EXHIBITION, 1862.

TWO PRIZE MEDALS.

Class 13, No. 2973.

PHOTOMETERS, &c.,

Jury Award: PRIZE MEDAL,

For "Photometric Apparatus—for a well-constructed Apparatus to determine the Illuminating Power of Coal-Gas."

(PHILOSOPHICAL INSTRUMENTS,
North Gallery.)

Class 31, Section B, No. 6350.

METERS, GOVERNORS, &c.,

Jury Award: PRIZE MEDAL,

For "General Excellence of Workmanship, and for his Improvements in Gas-Burners and Photometrical Apparatus."

(*Opposite*
AMERICAN DEPARTMENT.)

SERVIER'S
PATENT
SELF-ACTING GAS GOVERNOR.

This Instrument, which is designed to replace the ordinary Governor,

Operates solely by the Action of the Gas, without any Alteration of Weights, or the Assistance of any intermediate Agency or Apparatus whatever;

And it will maintain a Constantly Uniform Pressure in Gas-Distributing Mains, at any given point of their circuit.

All Applications for Licences to Manufacture or to Use the Apparatus to be made to

Mr. W. H. BENNETT, 42, Parliament Street, Westminster.

INTERNATIONAL EXHIBITION, 1862.

Class X. No. 2265.

THE JURORS HAVE AWARDED TO

JOSEPH COWEN & CO.,

BLAYDON BURN, NEAR NEWCASTLE-ON-TYNE,

THE PRIZE MEDAL FOR "GAS RETORTS, FIRE-BRICKS, &c., FOR

EXCELLENCE OF QUALITY."

JOSEPH COWEN & CO. were the only parties to whom a Prize Medal was awarded in the Great Exhibition of 1851 for

"GAS RETORTS AND OTHER OBJECTS IN FIRE-CLAY."

LIVESEY FIRE-CLAY WORKS,

NEAR BLACKBURN, LANCASHIRE.

ORLANDO BROTHERS,

MANUFACTURER OF PATENT CLAY RETORTS,

AND EVERY DESCRIPTION OF

TUBULAR GLAZED SEWERAGE PIPES, BENDS, JUNCTIONS, ETC.

FIRE-BRICKS, TILES, BLOCKS, AND CHIMNEY-TOPS.

WILLIAM & BENJAMIN COWAN,

PATENT WET & DRY GAS-METER MANUFACTURERS,

Buccleuch Street Works, Edinburgh, & 13, Strutt Street, Manchester.

Established 1827.

SOLE MANUFACTURERS OF

ESSON'S PATENT COMPENSATING GAS-METERS;

KAY'S PATENT HYDRAULIC VALVE GAS-METERS;

Also, DRY METERS OF THE MOST APPROVED DESCRIPTION;

All of the above being Stamped under the Provisions of the SALE OF GAS ACT.

W. and B. C. likewise supply ESSON'S PATENT COMPENSATING FOUNTAINS, and KAY'S PATENT HYDRAULIC VALVES, now so extensively used for bringing ordinary Meters within the requirements of the Act of Parliament. Gas Companies can, therefore, either attach the FOUNTAINS or VALVES to their old Meters themselves, or forward them to W. and B. C. for Alteration and Stamping.

GOVERNORS, STATION-METERS, PRESSURE-REGISTERS & GAUGES,

MINUTE-CLOCKS, PHOTOMETERS, EXPERIMENTAL METERS,

AND ALL OTHER DESCRIPTIONS OF GAS APPARATUS.

INTERNATIONAL EXHIBITION,

Class 31 (Sub-Class B), No. 6288.

Messrs. Cowan have been awarded Honourable Mention for Good Work in Meters.

International Exhibition, 1862.

MESSRS.

CROLL, RAIT, AND CO.,

Manufacturers of Croll's Patent Improved

DRY GAS-METER,

Exhibited in Class XXXI. (B),

Have obtained the Medal for

"GOOD CONSTRUCTION AND SOUND WORKMANSHIP."

FACTORY:

CANAL BRIDGE, KINGSLAND ROAD, LONDON, N.E.

ALEXANDER WRIGHT,

55 and 55A, MILLBANK STREET, WESTMINSTER, S.W.,

MANUFACTURER OF

CONSUMERS' COMPENSATING & NON-COMPENSATING WET GAS-METERS,

Of the best material and workmanship, carefully adjusted to meet the requirements of the SALES OF GAS ACT.

STATION-METERS & GOVERNORS,

WRIGHT'S REGISTERING PRESSURE-GAUGE, EXHAUSTER REGISTER, & REGULATOR;

STANDARD TEST GASHOLDERS;

Consumers' Governors; Inspectors' Pocket, King's, and all other kinds of Pressure-Gauges; Thermometers for Condensers, Pressure Registers, &c., &c.

EXPERIMENTAL TESTING APPARATUS,

Employed by the best experimenters in this country and on the continent, and by the Gas Testers in the London districts.

PHOTOMETERS, SPECIFIC GRAVITY APPARATUS, BI-SULPHURET OF CARBON TEST, THOMPSON'S BROMINE AND HEATING POWER OF FUEL TESTS, IMPROVED ALKALIMETER, EXPERIMENTAL METERS AND GOVERNORS, MINUTE CLOCKS, &c., &c.

"Analysis of Gas for Practical Men," by A. WRIGHT, M. Inst. C.E., post-free for 13 Stamps. PRICE-LISTS ON APPLICATION.

JAMES MEACOCK,

PATENT DRY AND WET GAS-METER MANUFACTURER,

7, SNOW HILL, AND 16, WEST STREET, LONDON.

ESTABLISHED 1836.

J. M. invites attention to his Improvements in EXPERIMENTAL WET GAS-METERS, by which he renders impossible any Leakage from the Stuffing-Box.

These METERS are GUARANTEED to meet all the Requirements of the SALE OF GAS ACT

GOVERNORS, STATION-METERS, PHOTOMETERS,

EXPERIMENTAL TESTING GASHOLDERS, HIGH-PRESSURE GAUGES,

AND ALL APPARATUS IN USE AT THE GAS MANUFACTORY.

D. HULETT and CO., 55 and 56, HIGH HOLBORN, LONDON,

PATENTEES and MANUFACTURERS of the ONLY GOOD MERCURIAL GAS REGULATOR,

invite the attention of Gas Companies and the Trade generally to their Improved GAS-METERS, which they warrant equal to any in Quality, Workmanship, and Simplicity of Construction, and the only Meters from which Gas cannot be obtained without being duly registered.

MANUFACTURERS OF

GAS CHANDELIERS, GLASS LUSTRES, HALL LANTERNS, VESTIBULES, BRACKETS, PENDANTS;

DOUBLE CONE, ALBERT, SHADOWLESS, & EVERY DESCRIPTION OF BURNER, UNION JETS, BATSWINGS, ETC.;

IMPROVED FULL-WAY CARTER'S VALVES (much approved of);

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